Draft Environmental Impact Report

the Grove
Mixed-Use Development
Shrewsbury, Massachusetts
EEA #15138

Submitted to:	Executive Office of Energy and Environmental Affairs Massachusetts Environmental Policy Act Office
Proponent:	Spagtacular LLC
Prepared by:	Rackemann Strategic Consulting, Inc. Waterman Design Associates, Inc. Green International Affiliates, Inc. Tech Environmental, Inc. Allevato Architects, Inc. Architerra, Inc.

April 30, 2015

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RACKEMANN
STRATEGIC CONSULTING, INC.
160 Federal Street
Boston, Massachusetts 02110
Phone: 617-951-1146 • Fax: 617-542-7437
email: sdavis@rackemann.com

Secretary Matthew A. Beaton
Executive Office of Energy and Environmental Affairs (EEA)
Attn: MEPA Office
100 Cambridge Street, Suite 900
Boston MA 02114

Re: Draft Environmental Impact Report (EEA #15138)
the Grove Mixed-Use Development, Shrewsbury

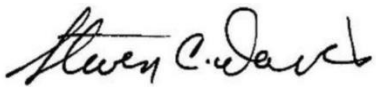
Dear Secretary Beaton:

On behalf of Spagtacular LLC, I am pleased to submit the attached Draft Environmental Impact Report (EIR) for review under the provisions of the Massachusetts Environmental Policy Act (MEPA). This Draft EIR responds to the Scope in your Certificate on the Expanded Environmental Notification Form (ENF) dated February 14, 2014, to your Certificate on the Notice of Project Change (NPC) dated August 8, 2014, and to each comment received during the MEPA review of the Expanded ENF and the NPC.

If comments received on this Draft EIR are straightforward and require no new analyses, we ask that you consider either publishing the Draft EIR as a Final EIR or requiring a simple Final EIR consisting of a Response to Comments.

Copies of the Draft EIR (including an electronic copy with the complete traffic data appendix) have been provided to all required recipients, shown in the attached Draft EIR Circulation List. Additional electronic copies and hard copies are available from me. I would be happy to answer any questions that you may have or provide any additional information that you may need during your review. I can be reached by telephone at 617-951-1146 or by email at sdavis@rackemann.com.

Sincerely,
Rackemann Strategic Consulting, Inc.



Steven C. Davis
Principal

Cc: EENF Circulation List
Spagtacular Team

RACKEMANN
STRATEGIC CONSULTING, INC.

the Grove, Shrewsbury Draft Environmental Impact Report Circulation List	
Secretary Matthew A. Beaton Executive Office of Energy & Environmental Affairs Attention: MEPA Office 100 Cambridge Street – 9th Floor Boston, MA 02114 Department of Environmental Protection Attention: Commissioner's Office One Winter Street Boston, MA 02108 Stella Tamul Department of Environmental Protection Central Regional Office 627 Main Street Worcester, MA 01608 Lionel Lucien Public/Private Development Unit Massachusetts Department of Transportation Ten Park Plaza Boston, MA 02116 Eric Nascimento and Chris Hogan MassDOT Highway Department – District 3 403 Belmont Street Worcester, MA 01604 Elizabeth Sherva Massachusetts Historical Commission The MA Archives Building 220 Morrissey Boulevard Boston, MA 02125 Energy Facilities Siting Board Attention: Barbara Shapiro One South Station Boston, MA 02110 Massachusetts Division of Energy Resources Attention: John Ballam 100 Cambridge Street, 10th Floor Boston, MA 02114	Jonathan E. Church Central Mass Regional Planning Commission 2 Washington Square Union Station – 2nd Floor Worcester, MA 01604 Board of Selectmen 100 Maple Avenue Shrewsbury, MA 01545 Jeffrey Howland, Town Engineer Engineering, Planning & Conservation 100 Maple Avenue Shrewsbury, MA 01545 Kristen D. Las, Principal Planner Planning Board 100 Maple Avenue Shrewsbury, MA 01545 Brad Stone, Engineer Conservation Commission 100 Maple Avenue Shrewsbury, MA 01545 Kerry Stockwell Board of Health 100 Maple Avenue Shrewsbury, MA 01545 Shrewsbury Public Library 214 Lake Street Shrewsbury, MA 01545 Mary Ellen Radovanic 3 Olde Colony Drive Shrewsbury MA 01545 Ron and Joyce Tarallo 22 Edgemont Road Shrewsbury, MA 01545 Martha J. Grant 29 Elm Street Shrewsbury, MA 01545

TABLE OF CONTENTS

LIST OF FIGURES

Note: Larger scale copies of figures shown with an asterisk (*) after the title can be found in Appendix A.

LIST OF TABLES

1.0 PROJECT DESCRIPTION

1.1 LOCATION AND SETTING

The Grove Project site, shown in Figure 1, contains approximately 30.9 acres of land located on the north side (westbound side) of the Boston Turnpike (Route 9), in the Town of Shrewsbury. Approximately 27 acres are owned in fee by the Proponent. These contiguous properties include: 365 Boston Turnpike and 315, 321, 325 & 335 Maple Avenue. The balance of the site (4 properties totaling approximately 3.8 acres) is not currently owned by the Proponent. However, 353 Boston Turnpike (Masonic Lodge) is under control, with a purchase and sales agreement to be executed shortly, and the Proponent will seek to acquire 104, 108, and 110 Oak Street in the future. Figure 2, Existing Conditions, shows the specific location of each of these properties.

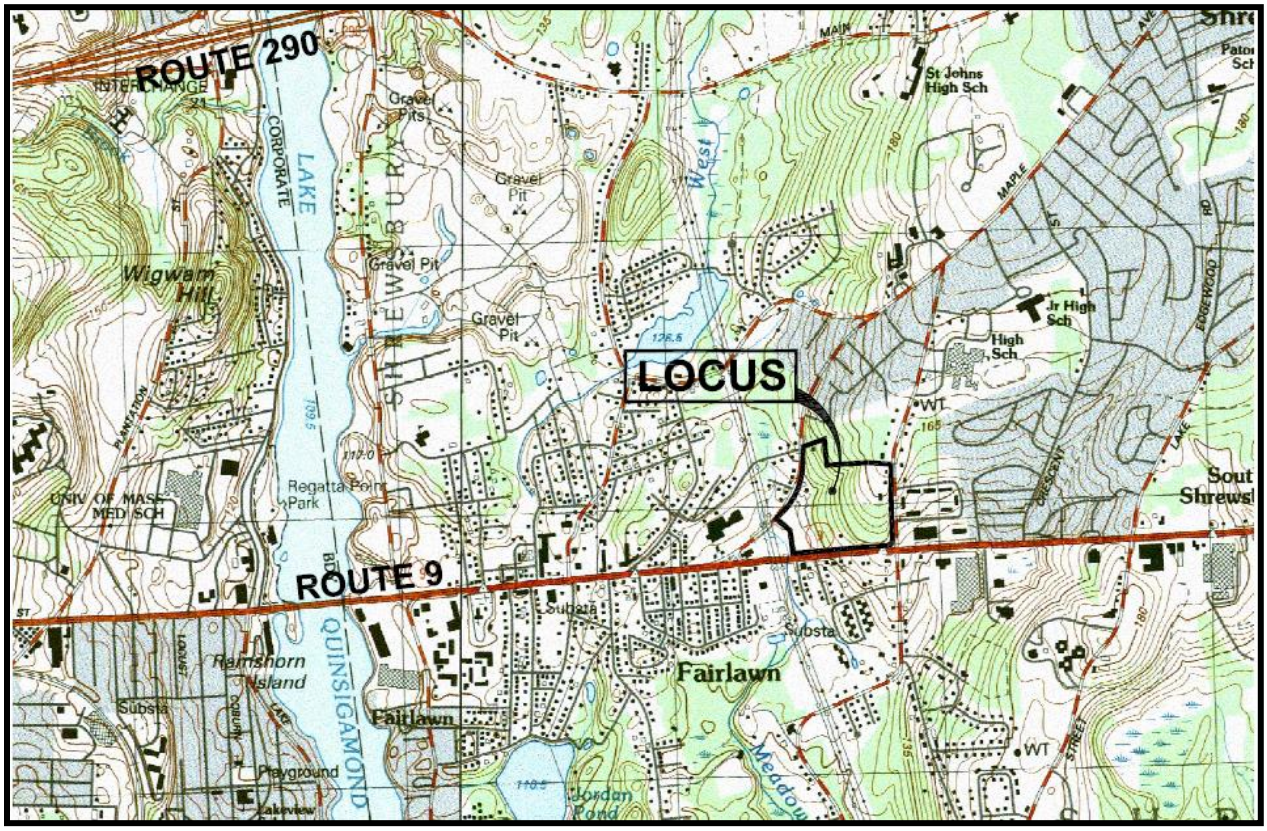


Figure 1. Location Plan

As can be seen on Figure 3, the majority of the Project site is located within the Commercial Business Zoning District, as well as the Lakeway Overly District. The aforementioned Oak Street properties and a small portion located at the northern tip of the site located along Maple Avenue are zoned Residential B-1/B-2.

The site is bound to the north by single family homes and vacant residentially zoned land; to the east by Oak Street; to the south by the Boston Turnpike; and to the west by Maple Avenue and land owned by the New England Power Company. The Route 9 corridor is characterized pri-

marily by mixed commercial uses; Maple Avenue is predominately residential north of the Project site; and Oak Street contains a mix of uses including commercial at its intersection with Route 9 and residential and public school property farther north.

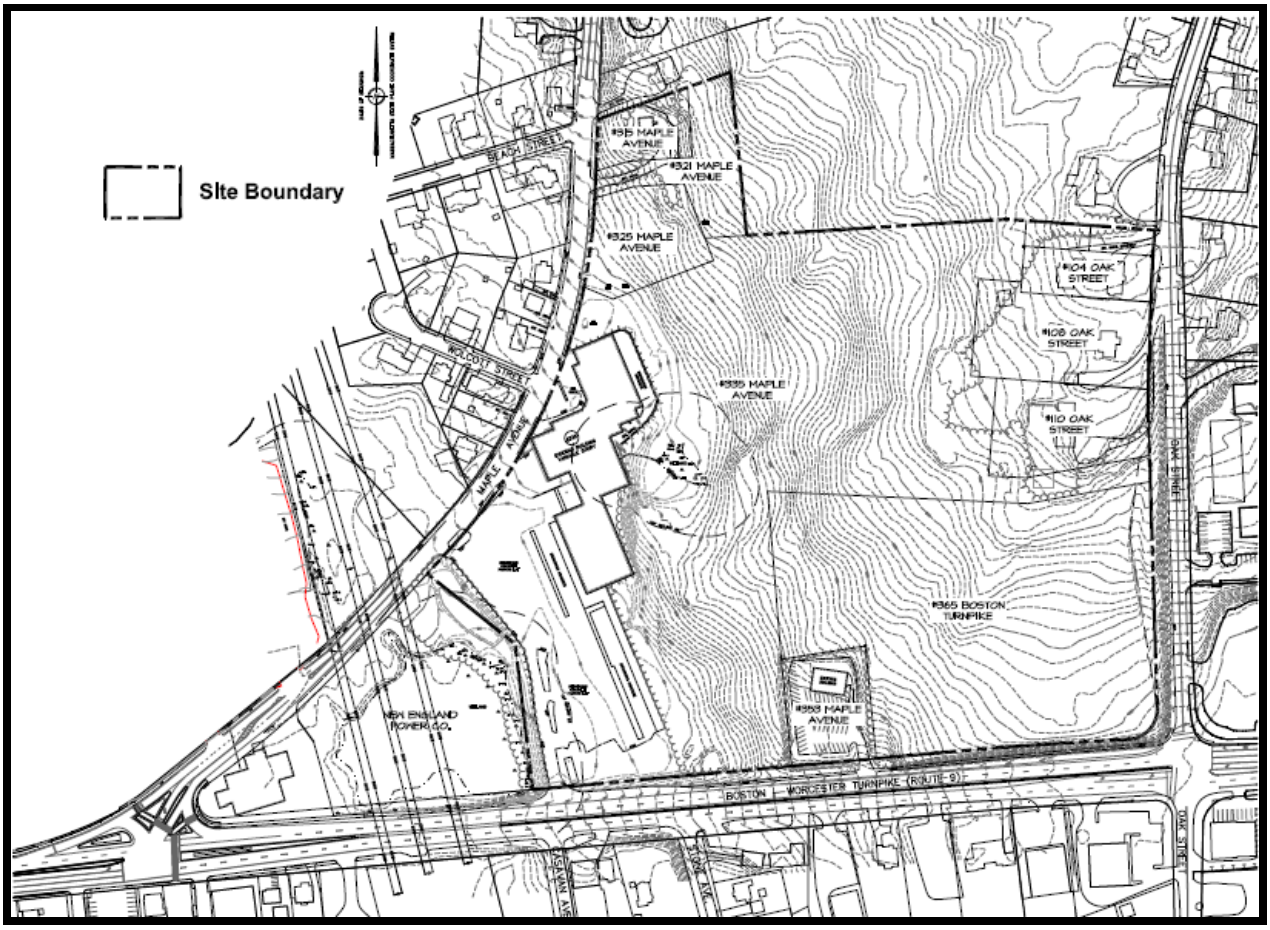


Figure 2. Existing Conditions*

Here and throughout this Draft EIR, lager scale copies of Figures shown with an asterisk (*) after the title can be found in Appendix A – Large Scale Plans.

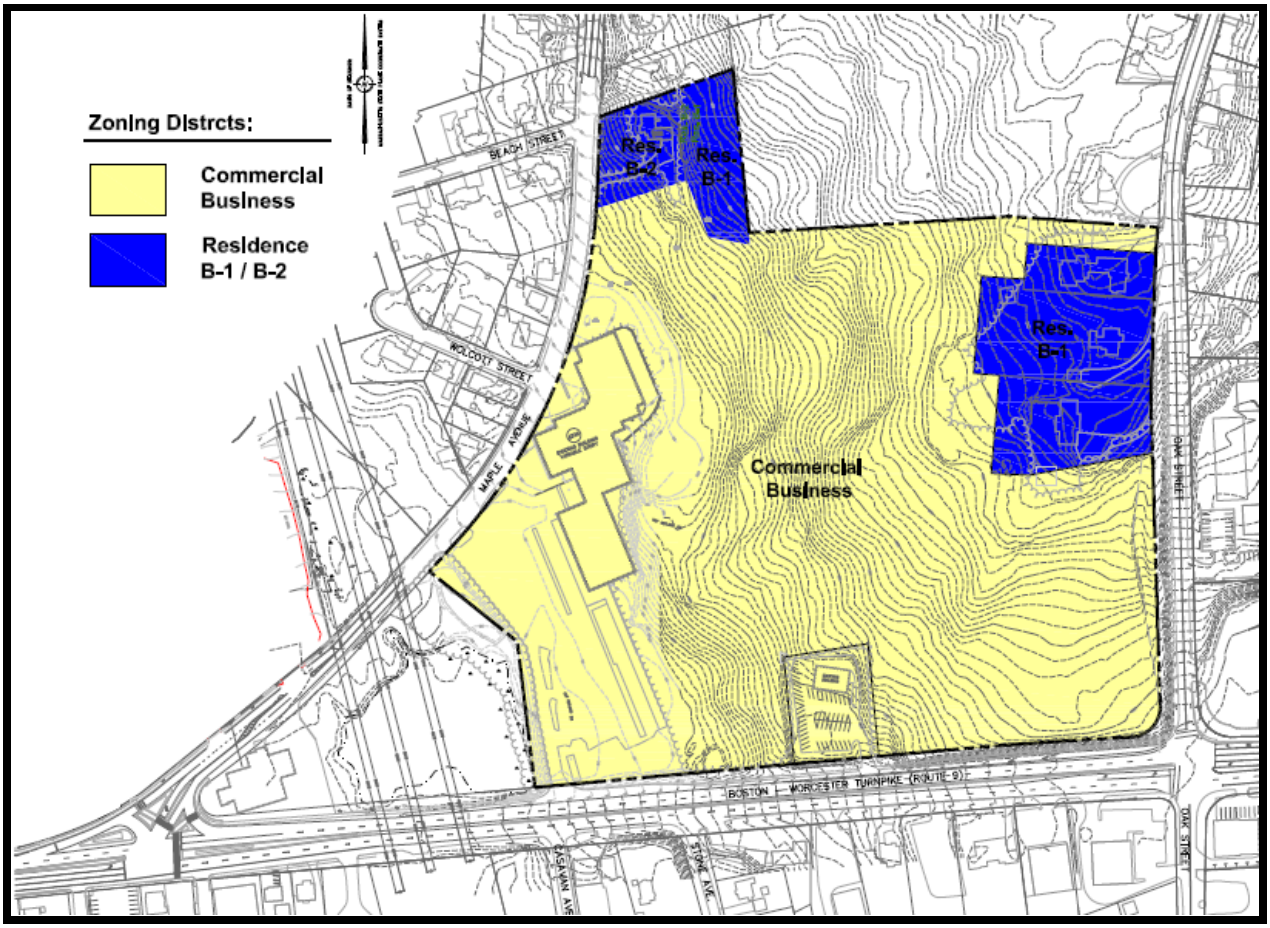


Figure 3. Zoning Districts

1.2 PROJECT PLAN AND PROGRAM

1.2.1 EENF Project

The Project, as initially proposed and reviewed in the Expanded Environmental Impact Report, provided a total of 243,000 square feet of mixed commercial space in four buildings and approximately 42,000 square feet of residential space in 19 single family dwellings. The Project was proposed in three phases, as illustrated on Figure 4. A Phase 1 waiver was granted to allow for construction of a 100,000 square foot building, consisting of a 45,000 square foot fitness club and a 55,000 square foot office component, supported by 450 parking spaces. Phase 2 included the balance of the new commercial space in addition to re-purposing approximately 57,000 square feet of the 84,000 square-foot former Chelmsford Building for commercial use. The balance of the building (approximately 27,000 square feet) was to be razed. Phase 3 included a 17-unit residential subdivision off Oak Street and two residential dwellings off Maple Avenue (one existing).

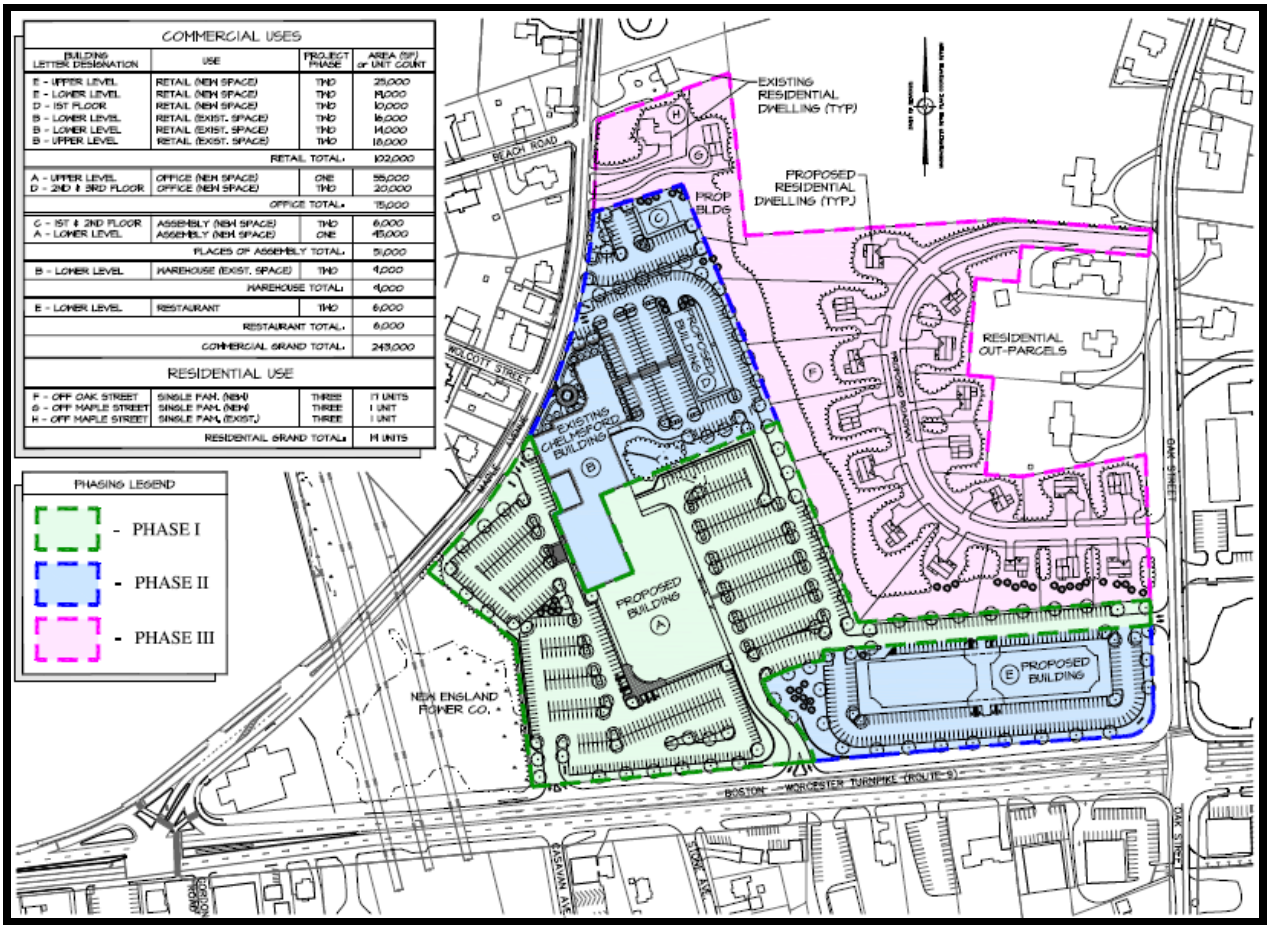


Figure 4. EENF Illustrative Master Plan

Access was proposed via two curb cuts on Route 9 (one right-in only and one right in/right out), two commercial curb cuts (two-way) and two residential driveways on Maple Avenue, and one commercial curb cut (two-way) and two residential curb cuts (two-way) on Oak Street. Phase 1 access included the two Route 9 curb cuts, the southerly Maple Avenue curb cut, and the southerly Oak Street curb cut.

The initial design was largely driven by the underlying zoning classifications that were in place at the time of the EENF filing and by the need to accommodate a specific Phase 1 tenant (a fitness club).

1.2.2 NPC Project

The Project, as most recently reviewed in the Notice of Project Change, increased the land area by approximately 3.1 acres to 30.9 acres by incorporating three residential parcels on Oak Street. The Project was reprogrammed to eliminate the single family housing component and incorporate multi-family apartment housing. Although multi-family housing is not allowed within the Residence B-1 zoning district, the Proponent was actively seeking a zoning modification to re-zone the Residence B-1 property to Commercial Business. The zoning modification was subsequently approved at Shrewsbury's Town meeting of September 2014; however, the re-

zoning included only that portion of the site owned and controlled by the Proponent; it did not include the 3.1 acres associated with the aforementioned Oak Street residential parcels. To realize the full build-out potential described in the NPC, a re-zoning of these parcels from Residence B-1 to Commercial Business would be required.

The full-build Project as revised proposed a total of 471,000 square feet of mixed-commercial space in six buildings and 143 dwelling units, 2 of which were single family homes. The Project was proposed to be built out in four phases, as shown on Figure 5. Phase 1 was reconfigured to improve the location and shape of the building and to take better advantage of the grade changes at the site. It comprised a smaller 37,000 square feet fitness use, 143,000 square feet of office, and 3 dwelling units (one duplex and one single family dwelling). Phase 1 also included relocating the Masonic Lodge from its current location on Route 9 to Maple Avenue. Similar to the EENF plan, portions of the former Chelmsford Building would be razed and others repurposed for commercial use. However, the revised plan would seek to repurpose only the original 1927 Art Deco portions of the building (approximately 36,000 square feet).

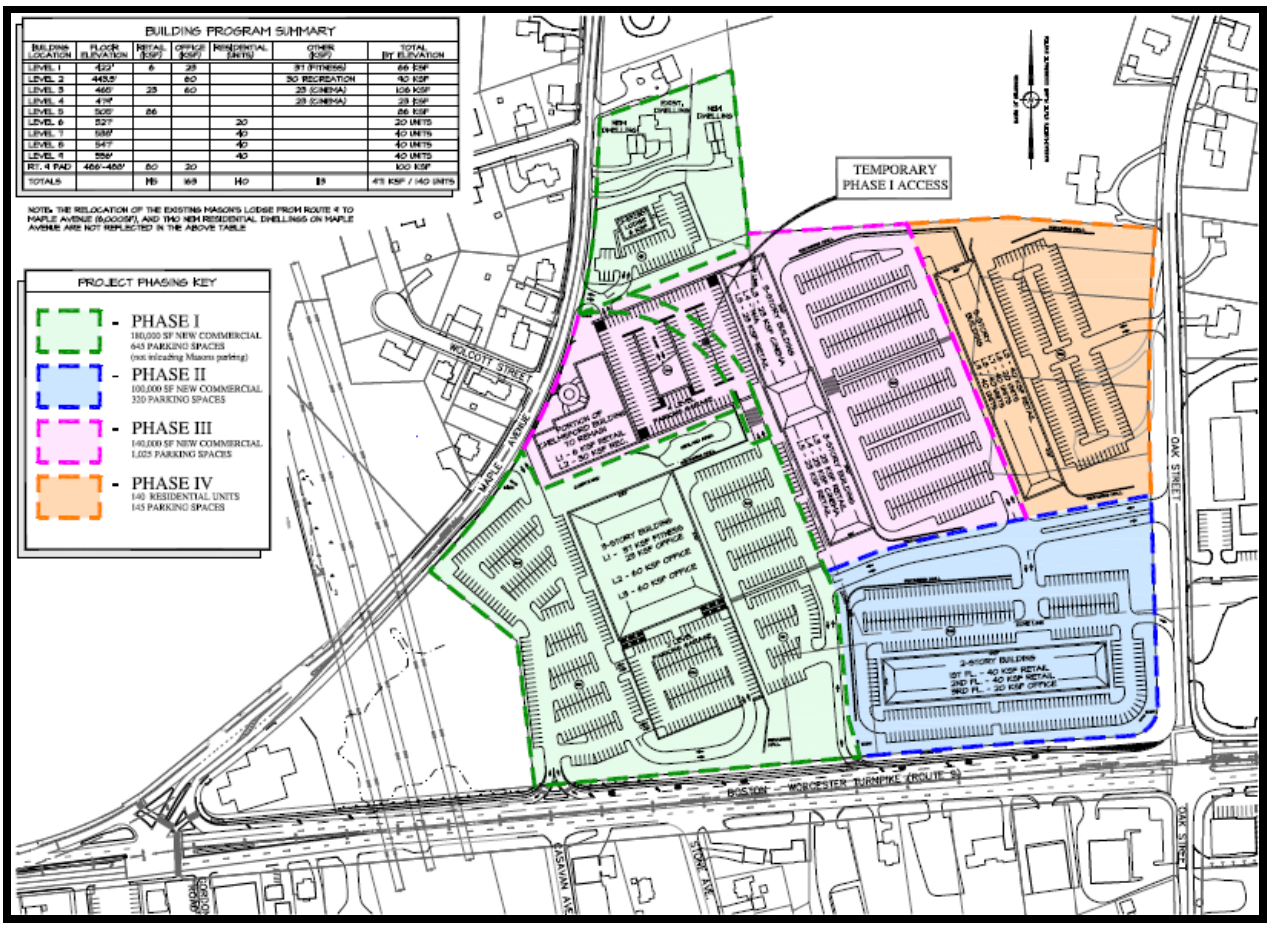


Figure 5. NPC Illustrative Master Plan

Access from Route 9 remained as one right-in only and one right in/right out. Two commercial curb cuts were proposed on Maple Avenue (both two-way). The revised plan also had two residential driveways on Maple Avenue, two commercial curb cuts on Oak Street (one two-way and

one right-out only), and one residential curb cut on Oak Street (two-way). Phase I no longer included access from Oak Street; a temporary driveway to Maple Avenue was proposed for secondary access.

1.2.3 Current Project

The Proponent is currently proposing a mix of commercial and residential uses in a vertical configuration, as shown on Figure 6. The plan calls for a total of 737,000 square feet of commercial space, including 453,000 square feet of retail, 198,000 square feet of office, a 50,000 square-foot multiplex cinema, a 6,000 square-foot Masonic Lodge (relocated from its current Route 9 location), and a 30,000 square-foot food court. In addition to the central food court, it is likely that a small percentage of the retail space will be designated as restaurant space. As with the previously reviewed Project, the original Art Deco portion of the former Chelmsford Building will be renovated and repurposed for commercial uses.

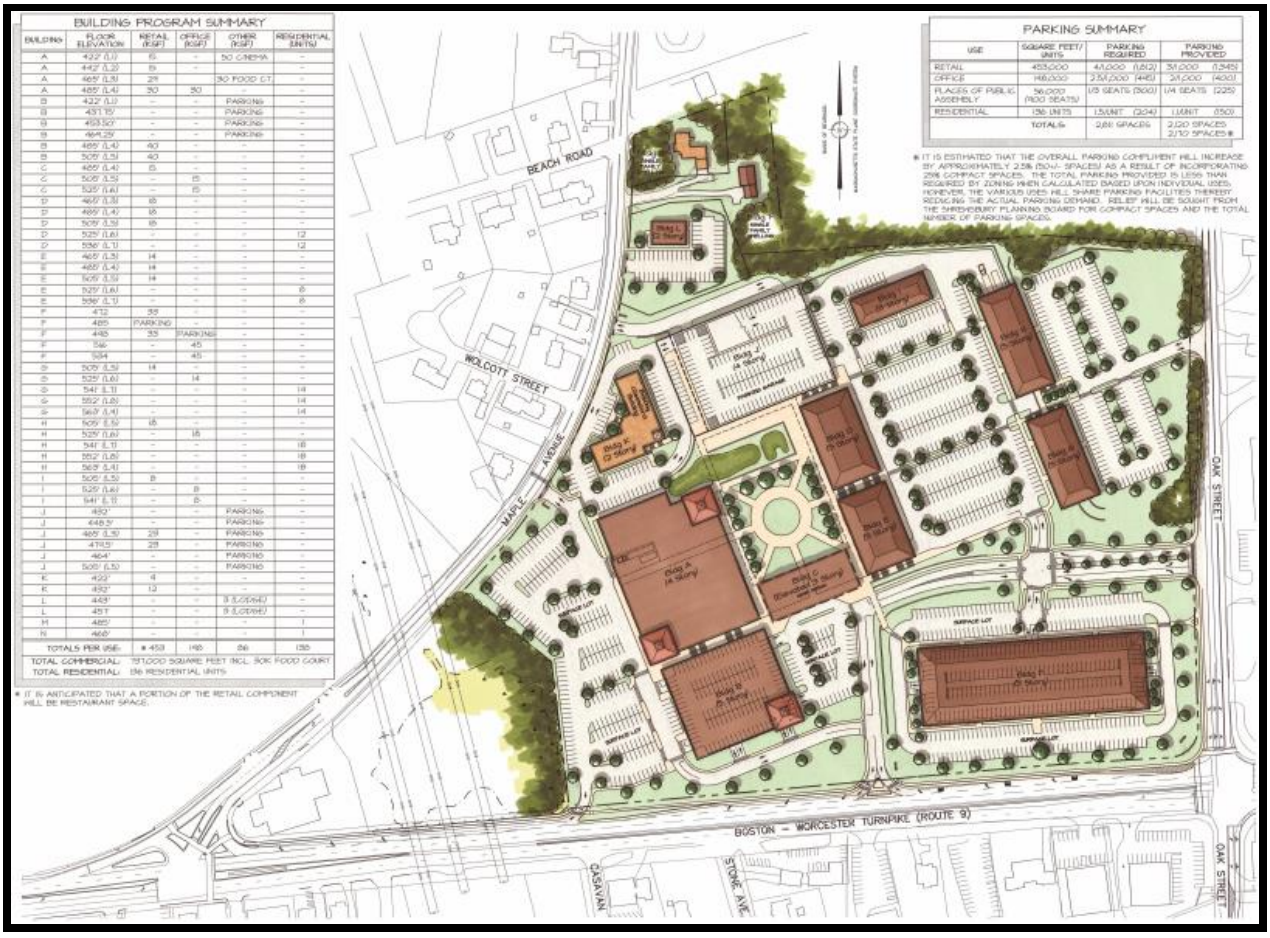


Figure 6. Illustrative Master Plan*

The residential component consists of 136 apartment units located above the retail and office uses, in addition to two single family dwellings (one existing). This is approximately the same as the previously reviewed Project; however, the units are better integrated among the commercial uses in an effort to create a more vibrant Project core and create a greater sense of vitality

for the commercial uses. .This approach also is consistent with the Town's desire to develop the Project (partially) under the provisions of the Lakeway Overlay District Regulations. As with the previously reviewed Project, the Oak Street residential properties would need to be acquired by the Proponent and re-zoned from Residence B-1 to Commercial Business. If the Proponent is not able to acquire and re-zone these properties, approximately 64,000 square feet of commercial space and 96 residential units (Buildings G and H) would be relocated within the Project.

Although the current master plan represents a substantial increase in density, it will result in a slight decrease of impervious surface as compared to the previously reviewed plan. This was achieved by increasing building heights, integrating levels of structured parking into two of the larger buildings, and introducing a large open air courtyard in the center of the site. Placing the parking levels above or setback from the adjacent grade allows storefronts to line the pedestrian ways, creating plazas and walkways around the perimeter of the central court yard. The Proponent is committed to creating a high-quality, pedestrian friendly environment, including interesting outdoor spaces and safe, brightly lit walkways to tie different areas and uses of the Project together.

Two vehicular driveways are proposed on Route 9, with one right-in/right-out driveway and one right-out only driveway. The location of the right-in/right-out driveway has been switched relative to the NPC plan, such that the fully functioning right in/right out curb cut occurs at the center of the Project where it better serves the critical mass of the Project. Three commercial curb cuts (two-way) and one residential driveway are proposed on Maple Avenue. One commercial curb cut and one residential curb cut (both two-way) are proposed on Oak Street.

A total parking compliment of approximately 2,170 parking spaces is proposed to serve the mix of uses. Approximately 50% of the spaces (1,085 Spaces) will be located within covered structured parking garages. The parking provided is approximately 23% less than required by zoning when calculated based on the individual uses. However, the uses will share parking facilities thereby reducing the actual demand. It also is assumed that 25% of the spaces will be designed as compact spaces. The Proponent will seek relief from the Shrewsbury Planning Board for a reduction in the number of parking spaces and for compact spaces, as the current bylaw does not include provisions for compact spaces in the Commercial Business Zoning District.

1.3 PROPOSED PHASING

In the EENF and the NPC, it was proposed to phase the Project, primarily to allow for early construction of a building for a fitness center. Since the review of the NPC, the fitness tenant has changed its plans, and there is no phasing needed to accommodate that use. Rather, only a limited amount of work is proposed under the terms of the Phase I Waiver as amended on September 12, 2014. To limit the potential for construction disruption to the operations of the Masonic Lodge, only the relocation of the Masons and the two houses in the northern part of the site along Maple Avenue are proposed to be constructed under the Phase I Waiver. Highway access permits have been applied for to allow access from Maple Avenue for these uses. The remainder of the Project likely will be constructed over a period of two years, beginning in late 2015 or early 2016 and extending through 2018. Construction most likely will begin in the southwest part of the site at Route 9 and Maple Avenue and proceed easterly to the northeast part of the site along Oak Street.

1.4 REQUIRED PERMITS

1.4.1 Local Approvals

The approvals required from the Town of Shrewsbury include:

Permit or Review Required	Board or Department	Description
Variances	Zoning Board of Appeals	The proponent will seek zoning relief (variances) from the Town Zoning Bylaw to allow for several items including a reduction in the number of parking spaces, the dimensions of a standard parking space, and for compact spaces.
Special Permit	Planning Board	A Special Permit may be required for those portions of the Project to be developed under the Lakeway Overlay District Regulations.
Site Plan Review	Planning Board	Site Plan Review is required for the Project due to the proposed uses, building square footage, and number of parking spaces.
Notice of Intent	Conservation Commission	The Project requires the filing of a Notice of Intent and issuance of an Order of Conditions from the Shrewsbury Conservation Commission due to proposed work within 100 feet of wetland resources areas located on and adjacent to the site.
Building Permit	Building Department	The Project will require Building Permits for proposed structures, retaining walls, and renovations to the existing Chelmsford Building.
Zone Change	Town Meeting	A zone change will be required if and when the residential properties located off Oak Street are acquired by the Proponent.
Sewer and Water Connections/Street Opening Permits	Department of Public Works / Sewer and Water Boards	The Project requires approval for water and sewer connection as well as for general street openings within public ways.

1.4.2 Commonwealth Approvals

The following three Commonwealth approvals are required:

Permit or Review Required	Department or Agency	Description
Access Permit	MassDOT	The Project will be creating new access points on and adjacent to State Highways (Maple Avenue and Route 9). Therefore, the Massachusetts Department of Transportation requires the issuance of Vehicular Access and Non-Vehicular Access Permits.
Historic and Archaeological Resources	Massachusetts Historical Commission	The Project will preserve the Art Deco core of the Chelmsford Building and will require either a Determination of No Adverse Effect or a Memorandum of Agreement.
Final Environmental Impact Report	MEPA	MEPA regulations require the review of the Project because it exceeds Land and Traffic thresholds and requires a state permit.

1.4.3 Federal Approvals

Only one federal approval is required:

Permit or Review Required	Department or Agency	Description
Construction General Permit	EPA	The Project will alter more than one acre of land during construction and will therefore require a permit under the NPDES stormwater program.

2.0 HISTORIC RESOURCES

As design for the overall Project progressed, it became clear that demolition of the warehouse additions to the Chelmsford Building would allow both for a more gracious site plan, for better overall design, and for an historically appropriate rehabilitation and reuse of the core building. For that reason, the Proponent seeks a Determination of No Adverse Effect from the Massachusetts Historical Commission (MHC) to allow this demolition and to guide the rehabilitation and reuse of the original Art Deco building.

2.1 ORIGINAL CONDITIONS

The Chelmsford Company building, shown in Figure 7, was originally constructed in 1927. Initially, it was a modest, though attractive, industrial building used for ginger ale production, bottling, warehousing, and distribution. It was built in the Art Deco style with a brick, stucco, and precast concrete façade and utilitarian interiors of exposed structure and concrete floors. In 1928, the Chelmsford Company was purchased by Canada Dry Ginger Ale, Inc., which continued to use the building for the production of ginger ale marketed under the Chelmsford name.

Figure 7. Chelmsford Building Original Conditions

The plant operated until the 1970's when it was purchased by the Spag's discount department store which used the building for warehousing. The building has been unoccupied since Spag's (purchased by Building 19 in 2002) closed in 2004. At some point in the building's history, concrete masonry units (CMU) and glass block replaced original multi-paned factory sash and skylights were disassembled and roofed over, diminishing daylight and views. Under Spag's ownership, five simple metal-clad and CMU warehouse additions were made to the building.

The Chelmsford Building is listed in the Massachusetts Cultural Resource Information System (MACRIS) as Inventory Number SRW.33. Details of its MACRIS listing are found in Appendix B – Historic Resources.

2.2 EXISTING CONDITIONS

The original 1927 building consisted of an L-shaped building with a one-story northwest wing and a two-story southwest wing topped by a central three-story tower. Today's building complex, partially shown in Figure 8, encompasses the original 1927 building as altered by five insensitive, high bay metal ware house additions constructed in the 1970's and 80's. The interior of the original building is devoid of any significant finishes or architectural details.

Figure 8. Chelmsford Building Current Conditions

All of the architecturally significant façades are oriented west toward Maple Avenue, including the three faces of the chamfered main entrance, two faces of the L-shaped portion, and two faces of the three-story tower. The northeast and southwest faces of the building have historically been "back of house" spaces and were used for storage areas and loading docks. The east facing façades were historically less prominent and ornate in their service as garage bays, loading docks, and other utilitarian spaces. The northeast and southeast façades of the three-story tower were clad in all brick instead of stucco.

The three-story tower is largely intact, although as can be seen in Figure 8, many of the original architectural details are covered, deteriorated, and in need of repair. Water damage, mold, cracking, and substrate separation are present in the stucco. Cracking, separation, and severe mortar damage is present in both the brick and precast concrete portions of the façade, including in the lettering of the iconic "Chelmsford Building" sign inset into the precast pediment of the tower. The northeast parapet on the tower has been removed. The original industrial sash glazing, visible in the Figure 7, has been replaced with brick and CMU infill and glass block.

The majority of the L-shaped original building is intact, but no longer visible from the exterior due to successive additions. The only portion of the original façade on the ground floor still visible from the exterior is one of the three faces of the chamfered corner main entrance. The two splayed entrance walls have been covered by warehouse additions. The main façade of the northwest wing is partially intact behind a 1981 loading dock addition. None of the original glazing is present and the entire parapet has been removed except in two limited locations over the main entrance and above the original end wall of the northwest wing.

The short façade of the northwest wing, visible only from the interior due to a warehouse addition to the northwest corner of the building, is still partially intact but severely structurally damaged. Acentric structural loading from the warehouse addition and the failure of steel tiebacks in the brick façade has caused structural deformation, bowing, and cracking to the point where restoration of the original exterior wall reconstruction may be infeasible—reconstruction may be the only viable option.

The main façade of the southwest wing was removed entirely and replaced with a plain CMU wall as part of a 1981 addition. The short façade of the southwest wing has been largely covered with a CMU wall as part of a warehouse addition. The structural condition of the original walls behind the warehouse addition is briefly addressed in a preliminary structural report but will need detail investigation as part of the ultimate rehabilitation design.

2.3 PROPOSED CONDITIONS

The Project will focus on an historically sensitive rehabilitation and adaptive reuse of the architecturally significant portion of the Chelmsford Company building. New uses, such as restaurant, retail, entertainment, and creative office, will require appropriate storefronts, daylight, and views. A rendering of the proposed conditions is shown in Figure 9. Additional detailed drawings of the proposed rehabilitation are attached in Appendix B – Historic Resources.

The Art Deco stone, brick, and stucco of the original building will be cleaned and restored to original condition as closely as possible, considering the current condition and availability of matching building materials. Where new materials must be added, such as for new or modified existing walls and to update doors and windows for new uses and energy efficiency, the original style of the building will be respected in the choice and finish of materials. The Project will rejuvenate the façade along Maple Avenue and accessorize the building with a new, widened stair and an accessible entries, new balconies for restaurant or retail use, new canopies to cover the balconies and exterior pedestrian paths, and a new building core of restrooms and services. The warehouse additions are of no architectural or historical significance and will be demolished.

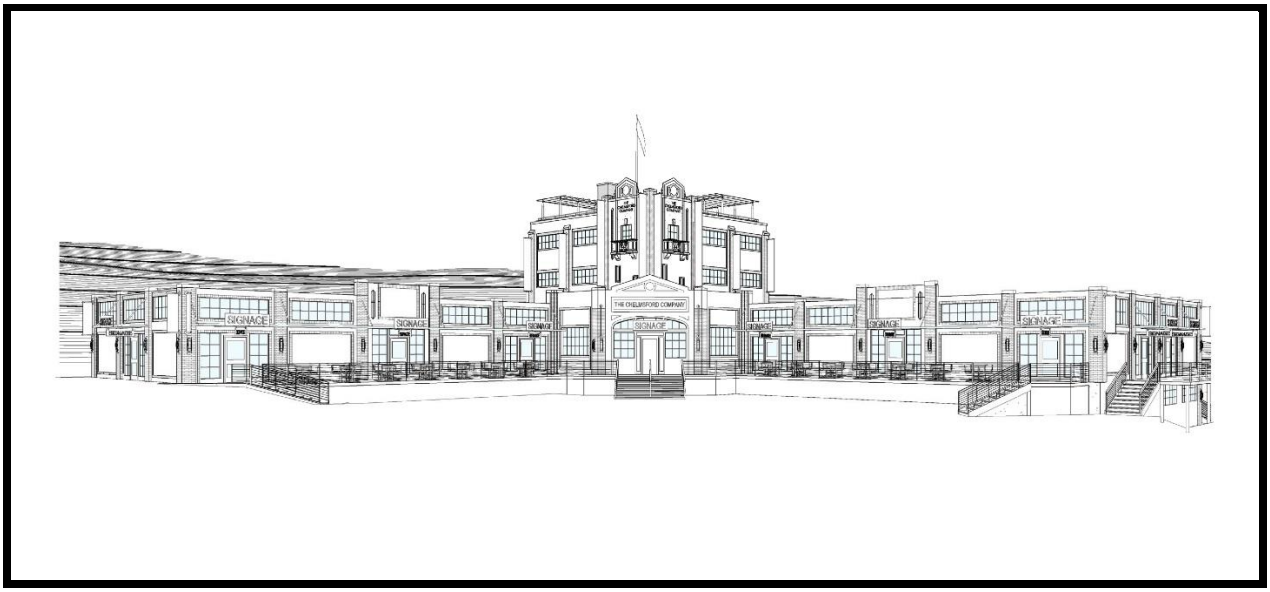


Figure 9. Chelmsford Building Proposed Conditions

The Proponent seeks a Determination of No Adverse Effect in recognition of the commitment to retaining the original structure, reviving its appearance, and devoting it to new uses. Following up on initial conversations with the MHC during the preparation of this Draft EIR, the Proponent will meet with the MHC during and following the MEPA review period to respond to any questions or comments on the proposed adaptive reuse.

3.0 LAND ALTERATION

3.1 EXISTING CONDITIONS

The subject property contains approximately 30.9 acres of land located on the north side (westbound side) of Boston Turnpike (Route 9) between Maple Avenue and Oak Street. Existing site improvements include the vacant Chelmsford Building located off Maple Avenue, the Masonic Lodge located off Route 9, a single family dwelling located off Maple Avenue, and 3 single family residential dwellings located off Oak Street. The most substantial improvements and impervious areas are associated with the Chelmsford Building located at the lowest elevations of the site along the western site boundary. The following sections generally describe the current site conditions.

3.1.1 Contours and Elevation

The site topography, shown on Figure 6, is moderate to steep sloping downward from east to west. Elevations vary from 556' at the highest point in the northeast corner adjacent to Oak Street to a low point of 402' in the southwest corner adjacent to Route 9. The most abrupt topographic relief occurs in the approximate center of the site where slopes are approximately 25-30%. Grades in the area of the Chelmsford Building and associated parking are generally 5% or less. The average grade of the Route 9, Maple Avenue, and Oak Street traveled ways along the site frontage are approximately 6%, 4%, and 9% respectively.

3.1.2 Vegetative Cover

As of early April, 2015, the majority of the site (approximately 19 acres or 60%) was undeveloped woodland consisting primarily of Elm, Oak, Black Birch, Red Maple, Sugar Maple, White Pine, and Hickory. Overstory trees are now being removed in a logging operation where they cannot be saved. However, stumps, understory vegetation, and ground cover will remain in place and no earth excavation is proposed until all local and state permits are obtained. A small bordering vegetated wetland and associated intermittent stream exists in the approximate center of the site, east of the Chelmsford Building. This wetland area can be described as a rocky, wooded swamp. The wetland vegetation consists mainly of Jewelweed, Elm, Red Maple, and Bluejoint. Other vegetated areas include off-grading slopes and manicured lawn areas associated with the residential dwellings. These areas represent approximately 4.8 acres (14%) of the site, as can be seen on Figure 10.

3.1.3 Impervious Surface

The site contains a total of approximately 5.5 acres of impervious surface (approximately 18 percent of the Project site). These areas include the Chelmsford Building and its associated parking, loading, and circulations areas; the Masonic Lodge and associated parking field; and four single family dwellings and associated driveways. Stormwater runoff from existing impervious surfaces generally flows westerly to the wetland area located on the New England Power Company property. There are minimal stormwater collections systems and no measures to treat, infiltrate, or mitigate peak flows of stormwater. The existing impervious areas are shown on Figure 10.

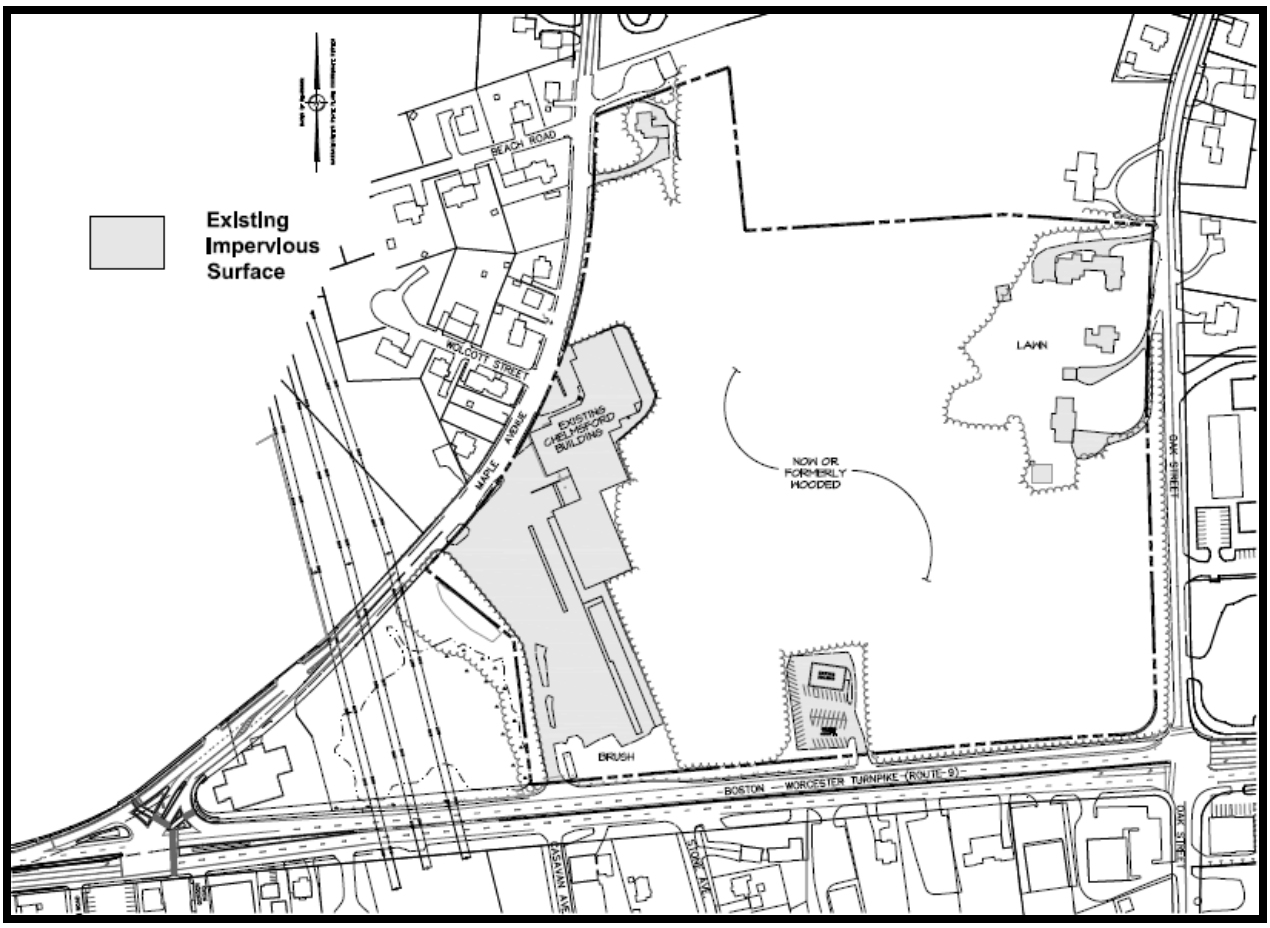


Figure 10. Existing Vegetative Cover and Impervious Surface

3.2 PROPOSED CONDITIONS

The proposed Project at full build-out will include approximately 737,000 square feet of mixed-commercial development, 136 apartment units, 2 single family dwellings, and supporting infrastructure. These figures include approximately 21,000 square feet of the existing Chelmsford Building to remain, one existing single family dwelling to remain, and a new 6,000 square-foot Masonic Lodge which will replace the existing lodge in kind. The existing Masonic Lodge located off Boston Turnpike and three single family dwellings located off Oak Street will be razed.

3.2.1 Clearing, Grading, and Blasting

Approximately 19 acres (60%) of the site is currently undeveloped. Due to the site's significant topographic relief, there are limited opportunities to preserve existing vegetation. To accommodate the proposed plan, approximately 18.5 acres are currently being cleared of overstory trees. No stump removal, grubbing, or excavation will occur until all required permits are issued. Prior

to the start of construction, the site will be grubbed and topsoil will be stripped and stockpiled for re-use on site.

The current master plan seeks to take creative advantage of the site's topography by establishing multiple building and parking tiers, stepping up in elevation from west to east. This concept is illustrated on Figure 6. In most areas, building foundation walls will act as retaining walls to create the various levels, ranging from the lowest pad at the west side of the site at approximately elevation 421, to the highest pad elevation at the east side of the site at approximately elevation 541.

The grade in the southeast quadrant of the site is elevated an average of 15 feet above the traveled way of Route 9 and Oak Street. The Proponent intends to lower the site grades in this area in order to create a better visual and physical relationship from the travelled ways to the proposed development. In general, earth cut materials removed from the higher site elevations will be used as structural fill material in lower fill areas.

Test borings and test pits were conducted at key location on the site to gain a general understanding of subsurface conditions. Based on these initial investigations and preliminary geotechnical studies, the subsurface condition of the site can generally be described as glacial till soils underlain by bedrock at varying depths. The parent soils materials, when handled in proper conditions, can be moved and used as structural fill beneath buildings and parking areas. Rock material can also be processed on site and used in construction to reduce the import of processed stone and gravel base materials.

The current master plan seeks to create a balanced cut to fill condition to minimize importing or exporting of earth materials. During the design development and final engineering phases of the Project, the proposed elevations will be adjusted as needed to balance the cuts and fills to the maximum extent possible.

The preliminary geotechnical investigation revealed the presence of potentially unsuitable fill materials beneath the existing parking area to the south and west of the Chelmsford Building. Some of the materials must be excavated and removed to accommodate subsurface detention and infiltration. Additional soil testing and analysis will be conducted to determine if the remaining areas can remain in place by means of deep dynamic compaction or similar methods or if they must be excavated and replaced to create a stable condition for new paved surfaces.

Bedrock was encountered in the majority of the test borings and test pits performed. The depth to bedrock from the ground surface varies from 3 to 16 feet. In some cases, the bedrock is weathered and could be penetrated with a backhoe to a depth of 5 feet or more. While a significant portion of the bedrock may be removable by means of excavating equipment alone, it is anticipated that drilling and blasting will be required where the deepest cuts are proposed and to accommodate utility trenching. All drilling and blasting will be performed in accordance with applicable local and state regulations.

As a result of the proposed grading and various building and parking tier elevations, the deepest earth cuts will be limited to approximately 40 feet, with the majority of cut depths being less than 15 feet.

3.2.2 Landscaping and Open Space

As evidenced by the Project name itself, "the Grove," the Proponent recognizes the value of landscaping and is committed to providing significant green areas and landscape plantings, not only for aesthetic value, but also for creating shade, defining outdoor spaces, and providing wind barriers, improving air quality, and decreasing sound transmission. For these reasons, the current master plan (shown in Figure 6) and subsequent plans to be submitted for local permits will include extensive green space and landscape plantings.

Within the Commercial Business Zoning District, the Town of Shrewsbury Zoning Bylaw requires a minimum of 20% open space, 5% interior landscaping for parking areas, and 20-foot landscaped areas along the entire roadway frontage. In addition, one tree per 50 feet of the site perimeter is required.

The Master Plan as proposed provides approximately 8.4 acres (27%) of open space as defined by the Bylaw. These areas include a large center green area labeled as "the Quad at the Grove" on the master plan, as well as significant green areas along the Route 9 and Oak Street frontage. A minimum of 5% interior parking area landscaping is provided with extensive tree plantings. The number of tree plantings within "the Grove" will far exceed that of which is required under the Bylaw.

3.2.3 Impervious Surface

The impervious surface of the existing and proposed buildings and associated paved parking, access, circulation, service areas, sidewalks, and pedestrian plazas will result in approximately 22.5 acres of impervious coverage (approximately 73 percent of the Project site).

In an effort to further reduce the impervious coverage, the Proponent will work with the Town of Shrewsbury to seek relief for the number of parking spaces required, reduction to the dimensions of a standard parking stall from 9'x19' to 9'x18', and provisions to allow for 25% compact spaces. These measures will collectively result in a reduction in impervious surface of over one acre. In addition, multi-level structured parking is proposed in several areas of the site, which creates efficient parking while minimizing the impervious coverage.

Pedestrian walkways and exterior pedestrian plazas will be designed to allow for unimpeded pedestrian flow, but will not be unnecessarily wide or expansive.

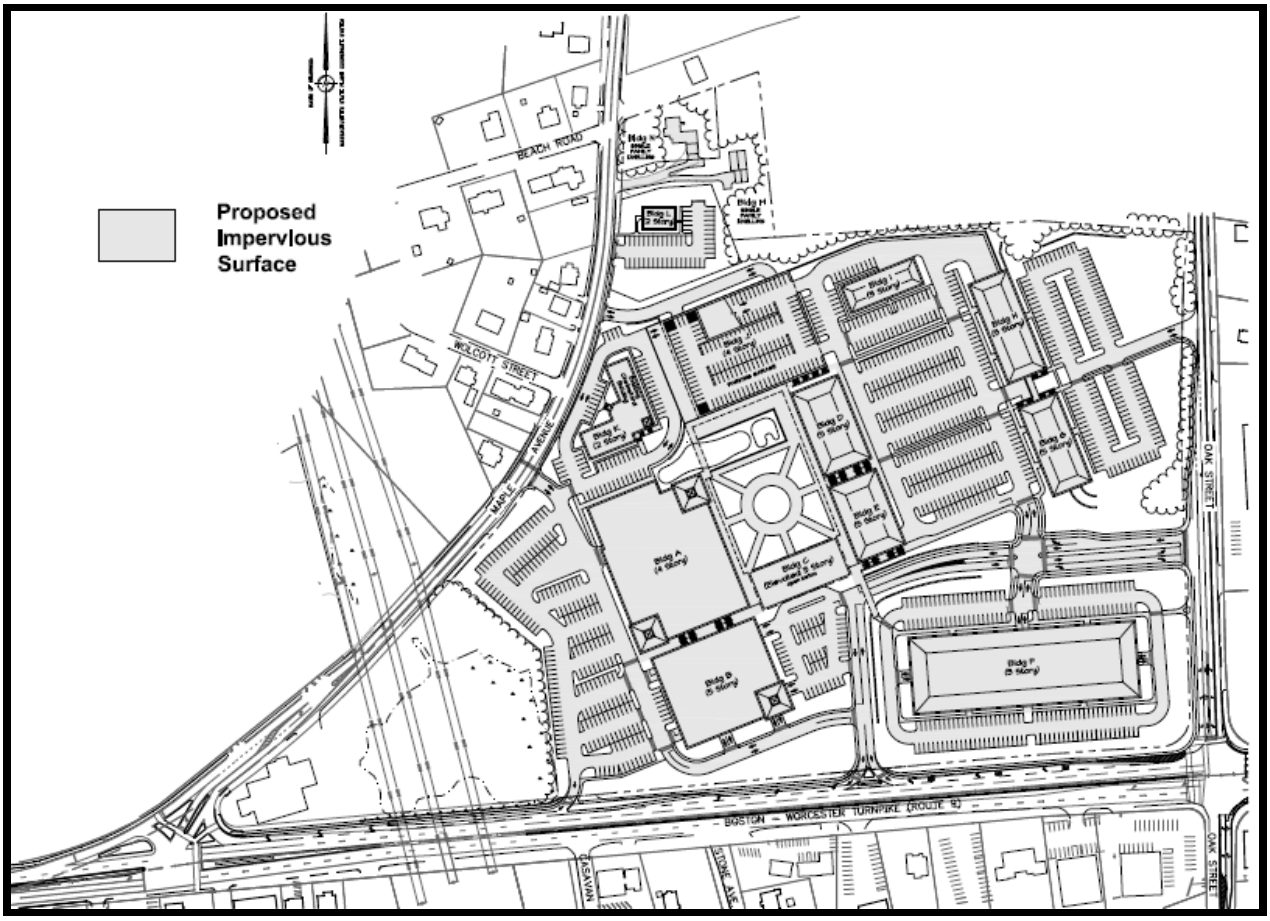


Figure 11. Proposed Impervious Surfaces

3.2.4 Building Coverage and Parking

The proposed buildings and uses are configured in a vertical fashion to take advantage of the site's topographic relief and the maximum allowable height requirements within the Commercial Business Zoning District. The vertical mix of uses provides the necessary density while minimizing the building footprints and associated impervious coverage. The total building coverage on site will be approximately 7.2 acres.

Based on the parking requirements of the Shrewsbury Zoning Bylaw, the Project requires a total of 2,811 parking spaces when calculated based on each individual use. As proposed, the Project will provide approximately 2,120 spaces. This figure may be increased to approximately 2,170 spaces if 25% of the spaces are designed as compact spaces.

The Project contains a mix of uses including retail, restaurant, office, entertainment, and residential uses. In a mixed-use environment, the overall parking demand is reduced by two important factors:

- The parking facilities are shared to serve two or more uses, which results in a reduction in the overall parking demand by hour, by day, or by season. In order to realize the maximum shared parking benefit, it is important that the parking be convenient and centrally located to the uses it serves. It is also important to provide convenient pedestrian connectivity throughout the site. This encourages people to patronize multiple uses, originating from a single vehicle trip. It also discourages people from driving from one use to another within the same development.

- In a mixed-use environment, the peak parking demands are typically offset for several of the proposed uses. For example, the parking for residential use is at its lowest demand during regular business hours, while the demand for office use is at peak demand during the same time period. This condition is inverted during evening hours.

As a means to maximize the efficiency of the parking facilities and reduce the impervious surfaces associated with parking, the Proponent intends to work closely with the Town of Shrewsbury to seek the following:

- A reduction in the overall number of parking spaces based on the aforementioned merits of a mixed-use project.
- A reduction of the dimensions of a standard parking stall from 9'x19' to 9'x18'.
- Design of 25% of the parking as compact spaces.
- Designated employee parking areas to ensure that the most convenient parking is available for patrons at all times.

Approximately 50% of the parking is proposed within multi-level parking structures, which is highly efficient use of the land for parking and significantly reduces impervious coverage.

The following table summarizes the proposed parking by use.

Table 1. Parking Summary

Land Use	**Square feet or unit count**	**Parking required**	**Parking provided**
Retail	453,000	4/1,000 sf (1,812)	3/1,000 sf (1,345)
Office	198,000	2.5/1,000 sf (495)	2/1,000 sf (400)
Places of assembly or entertainment	56,000 (900 seats)	1/3 seats (300)	1/4 seats (225)
Residential	136 units	1.5/unit (204)	1.1/unit (150)
	Totals	**2,811 spaces**	**2,120 spaces - 2,170 spaces ***

*It is estimated that the overall parking compliment will be increased by approximately 2.5% (50+/- spaces) as a result of designing 25% of the parking as compact.

3.3 MITIGATION MEASURES

Impacts associated with land alteration will be mitigated by implementing the following measures:

1. Creation of approximately 8.4 acres (27%) of open space. These areas include a large center green area labeled as “the Quad at the Grove” on the master plan, as well as significant green areas along the Route 9 and Oak Street frontage. A minimum of 5% interior parking area landscaping is provided with extensive tree plantings. The number of tree plantings within “The Grove” will far exceed that of which is required under the bylaw.

2. As a means to reduce the number of parking spaces and the impacts associated with impervious coverage, the Proponent proposes the following:

    - Provide multi-level structured parking;
    - Shared parking facilities resulting in a 23% reduction in the overall parking provided, as compared to that required under zoning;
    - Reduced parking stall dimensions;
    - Incorporate 25% compact spaces; and
    - Designate employee parking areas.

3. As a means to take advantage of the site’s topographic relief and achieve the desired Project density, while minimizing the building footprints and roof areas, the mixed-uses are terraced in a vertical fashion.

4.0 WETLANDS

4.1 EXISTING CONDITIONS

Wetland resources areas located on or immediately adjacent to the Project site were delineated by Waterman Design Associates, Inc. in August of 2013. Resource areas include Bordering Vegetated Wetland (BVW) and Intermittent Stream Bank. These areas were delineated based upon a review of vegetation, soils, hydrology, observable bank, and other indicators. All resource areas are clearly marked in the field by blue flagging and have been mapped by on the ground field survey.

The on-site wetland resource areas, illustrated on Figure 10, include a small (BVW) and associated intermittent stream in the approximate center of the site, directly east of the Chelmsford Building. The BVW measures approximately 3,850 square feet and is characterized as a rocky, wooded swamp, vegetated primarily by Jewelweed, Elm, Red Maple, and Bluejoint. The BVW is defined in the field by flag numbers labeled WF-A thru WF-P. An intermittent stream approximately 70 feet in length flows out of the BVW in a westerly direction where it is intercepted by a catch basin and conveyed beneath the Chelmsford Building via underground piping to an off-site wetland area located on the adjacent New England Power Company land.

A second BVW exists partially on-site and extends off-site at the western property boundary. The majority of the BVW is located off-site on land owned now or formerly by New England Power Company. The eastern portion of this BVW is defined in the field by flag numbers labeled WF-1 thru WF-20. This BVW follows a well-defined toe of slope to the west of the existing parking area and toe of slope along Route 9. The BVW is classified as a wooded shrub swamp consisting mainly of Red Maple, Spicebush, Cattail, Glossy Buckthorn, Jewelweed, Bluejoint, Sensitive Fern, Arrowwood, Elm, and Speckled Alder. Adjacent upland areas are dominated by Common Buckthorn, Hickory, Bittersweet, Multiflora Rose, and Tartarian Honeysuckle.

4.2 PROPOSED CONDITIONS

Due to the location and geometry of the existing on-site wetland resource area, Project construction will permanently alter approximately 2,200 square feet of BVW and 50 feet of intermittent stream. The permanent alteration and associated replication area are subject to the approval of the Shrewsbury Conservation Commission.

To compensate for the proposed permanent wetland impacts associated with the Project, the Proponent intends to construct a wetland replication area of approximately 5,700 square feet, therefore creating a total wetland area of 7,350 square feet. The replication area will be immediately adjacent to the wetland altered by the proposed development. The small, rocky intermittent stream will also be replicated through a portion of the existing wetland and through a portion of the replicated wetland for a total stream length of approximately 100 feet.

4.3 MITIGATION AND PERFORMANCE STANDARDS

The proposed alterations to the wetland resource areas or their buffer zones will be subject to a filing of a Notice of Intent (NOI) with the Shrewsbury Conservation Commission. Mitigation will include wetland replication to compensate for the loss of BVW at a minimum ratio of 1:1—a re-

placement ratio of about 2.6:1 is proposed. Replication areas will be designed and constructed in accordance with the requirements of the Shrewsbury Conservation Commission and the Wetlands Protection Act Regulations, 310 CMR 10.0.

The detailed wetland replication grading, construction details, and construction sequence will be developed in accordance with Massachusetts Inland Wetland Replication Guidelines dated March 2002 and will follow the general outline described below.

- The replication area and intermittent stream will be graded to intercept groundwater based upon soil auger profiles and test pit information and will be fed with clean or treated surface water runoff at a rate and volume consistent with the existing conditions tributary drainage area. Groundwater and surface water conditions are proposed to be replicated to provide the constant hydrologic connection necessary to sustain wetland vegetation consistent with existing species.

- The replication area will be rough graded immediately prior to the alteration of the impact areas, and any materials excavated from the altered wetland will be distributed throughout the replicated wetland to the elevation shown on the plans. Supplemental soil enhancement will be by a 50/50 mix of clean topsoil loam and peat mixture. The area will also be planted with a dense mixture of local and native wetland tree and shrub species, including Red Maple, Elm, and Spicebush, and over seeded with “New England Wetmix” distributed throughout the area to supplement vegetative cover.

- After the construction of the wetland replication area and intermittent stream, a wetland specialist will monitor the area for a minimum of two years or as otherwise directed by the Shrewsbury Conservation Commission. If there is vegetative mortality or the wetland seed mixture does not thrive during the monitoring period, additional seeding and planting will be performed to ensure the viability of the replicated wetland.

The (NOI) for the work described above will include Mass DEP Delineation Field Data Forms indicating soil information from test augers, hydrology, and vegetation. Design information will include construction details including grading, planting, construction sequencing, and subsequent monitoring program. The NOI filing will be copied to Mass DEP at the time of submission to the Shrewsbury Conservation Commission.

5.0 STORMWATER MANAGEMENT

5.1 EXISTING CONDITIONS

The Project Site, shown on Figure 12, contains approximately 30.9 acres of land located on the north side (west bound side) of the Boston Turnpike (Route 9), in the Town of Shrewsbury. The site consists of vacant commercial buildings (warehouse, retail, and office) with associated parking and loading, a single-family house in the northwest corner, and a large vacant tract on the eastern portion of the site (adjacent to Oak Street and Route 9).

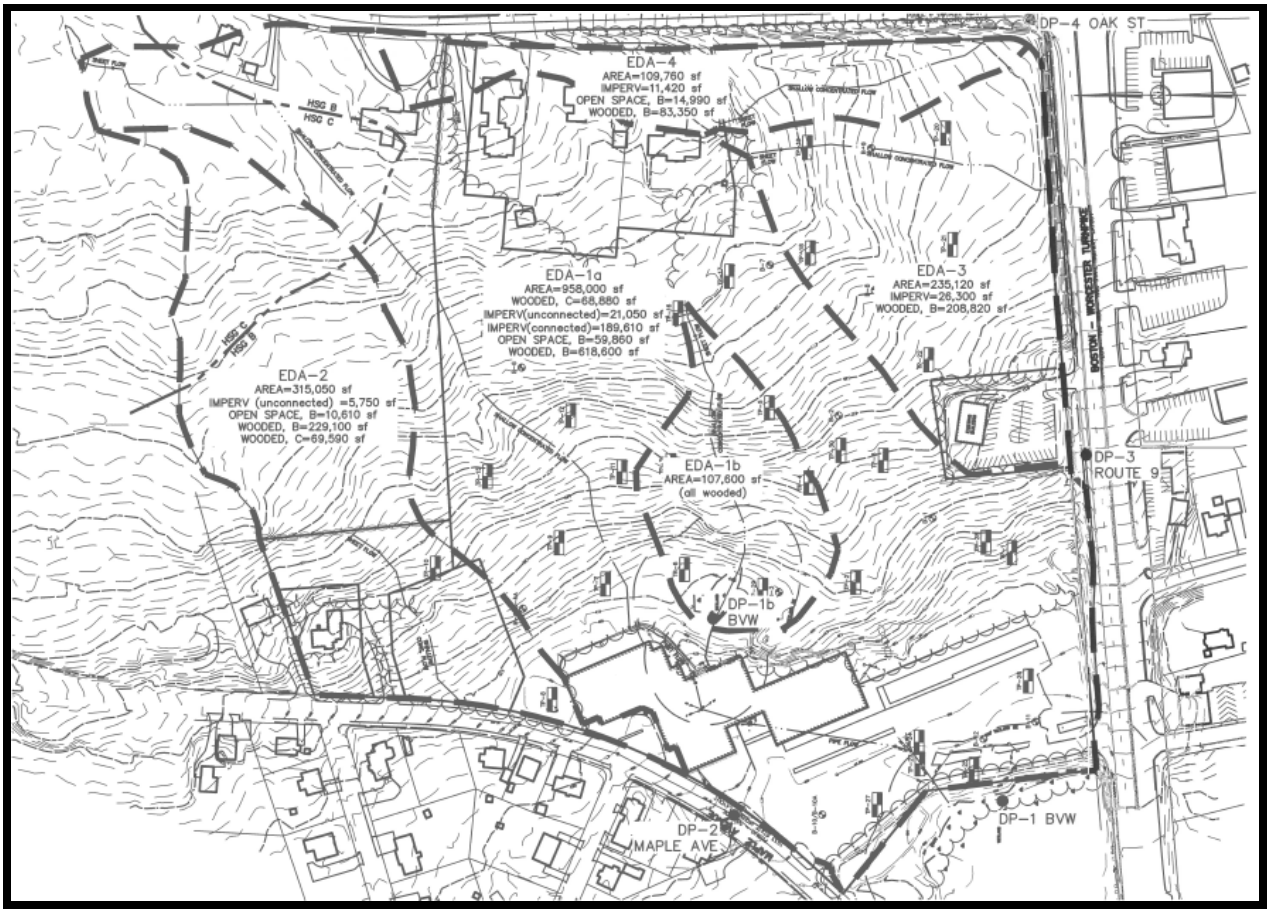


Figure 12. Existing Drainage Conditions*

United States Department of Agriculture Natural Resources Conservation Service (NRCS) mapping identifies the soils of the subject site as Canton fine sandy loam (Hydrologic Soil Group B, HSG B) with an area of Woodbridge fine sandy loam (HSG C) off-site to the northeast. Soil testing was performed in December 2006 and January 2007 by LFR, Inc. Test results in existing wooded areas indicate sandy loam dense glacial till with the characteristics of HSG B. Bedrock was observed in 18 of the 27 test pits excavated from depths of 2' to 15'. Test pits excavated in the previously developed areas west of the existing buildings indicate 3' to 14' of miscellaneous fill/debris. Groundwater was encountered in a fraction of the test pits at depths of

7'-14'; root structures were observed to depths of 30"-36" possibly indicating seasonal high groundwater tables just under subsoil within the parent glacial till materials.

A small intermittent stream and associated bordering vegetated wetland exists in the central portion of the site (upgradient of the existing buildings) which drains to a closed drainage system routed beneath the building slabs and to the upland adjacent a bordering vegetated wetland to the west of the Project site (off site on land now or formerly owned by England Power Company). The site generally drains from the east to the west with elevations ranging from 556' in the northeast corner to 402' in the southwest corner. There exists on site a closed drainage system which collects runoff from developed portions of the site and discharges stormwater to the upland area at the west property line (tributary to the New England Power Company wetland). There are no provisions on the existing site for water quality treatment, groundwater recharge, or peak flow attenuation.

5.2 PROPOSED CONDITIONS

The proposed drainage conditions are shown on Figure 13. A complete discussion of stormwater drainage is provided in Appendix C – Stormwater Management Report, which also contains larger scale copies of Figure 12 and Figure 13.

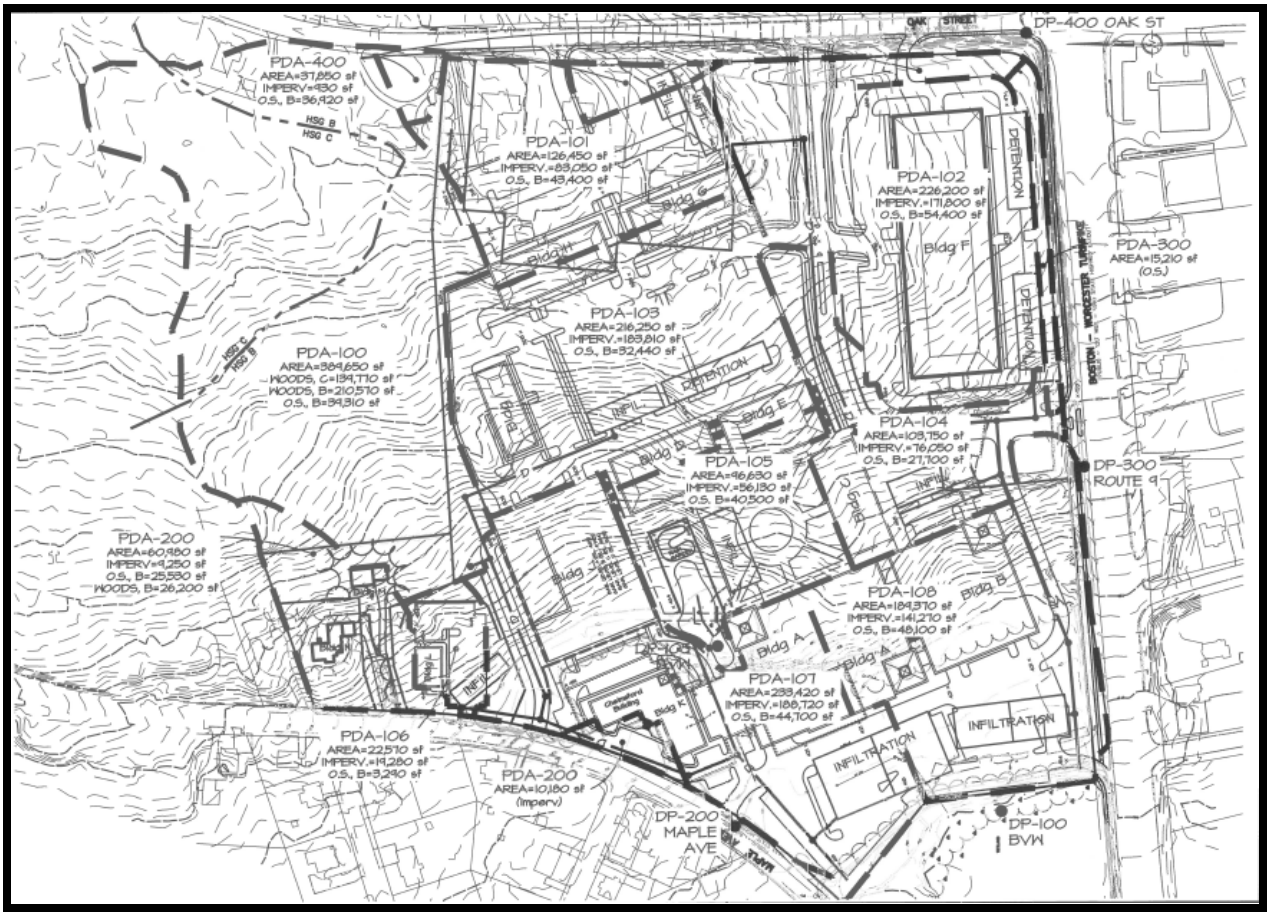


Figure 13. Proposed Drainage Conditions*

All stormwater runoff from the parking areas and driveways will be collected in deep-sump, hooded catch basins, conveyed to stormwater treatment units, and then to various subsurface infiltration systems and subsurface detention systems located throughout the site. Existing fill in areas proposed for subsurface infiltration will be over-excavated and backfilled with free-draining soil material from existing glacial tills cut from other portions of the site as this material will closely represent pre-existing soils.

Controlled outflow from the infiltration systems will be discharged to upland areas on-site at a rate equal to or less than existing conditions for the 2, 10, 25, and 100-year, 24-hour design storms. In addition, rooftop runoff from the proposed buildings will be directed to subsurface infiltration facilities to infiltrate the required volume to meet the requirements of the Massachusetts Department of Environmental Protection (MassDEP) Stormwater Management Standard #3 and to mitigate peak runoff volumes. The system was designed fully to meet the standards of the Town of Shrewsbury and the MassDEP Stormwater Management Regulations.

5.3 MITIGATION AND MANAGEMENT STANDARDS

5.3.1 Standard #1 – No New Untreated Discharges

The stormwater collection system has been designed so that all stormwater runoff from the roadway, parking areas, and drive aisles is treated through a treatment train consisting of deep-sump, hooded catch basins, stormwater treatment structures, and subsurface infiltration systems located throughout the site in areas of fill and deeper soils with no shallow bedrock. The outlets have been designed so that there will be no erosion or scour to the wetlands of the Commonwealth.

5.3.2 Standard #2 – Peak Rate Attenuation

United States Soil Conservation Service, “Urban Hydrology for Small Watersheds, Technical Release Number 55” (TR-55) methods were used to develop runoff hydrographs for watershed areas affected by the proposed development. Existing and proposed runoff hydrographs were developed for the 2, 10, 25, and 100-year, 24-hour rainfall events for the purpose of developing a stormwater management system that will limit post-development peak runoff rates to pre-development levels.

In order to assess the impact of the proposed development on peak runoff rates onto down-gradient properties, hydrologic calculations were performed for each of four design storms at the ultimate design point. Table 2 allows for comparison of existing and proposed conditions peak runoff rates; the table demonstrates that the proposed stormwater management system will be effective in limiting peak rates of runoff from the subject property to approximate pre-development levels.

The table also shows the peak runoff rates for two of the intermediate design points: the on-site bordering vegetated wetland and the peak flows to Maple Avenue for reference. Note that the proposed BVW replication for the on-site BVW is over two times the size of the existing on-site BVW, therefore the runoff rates to the replication area are increased to ensure that surface hydrology to the BVW is maintained in addition to the groundwater flows. The Maple Avenue peak runoff rates are also provided as a separate line to show that the proposed Project will route runoff away from Maple Ave to help alleviate the existing flooding problems voiced by the Town of Shrewsbury. Additionally, peak flows to both Oak Street and to Route 9 are reduced in all

storms by redirecting contributing drainage areas away from the public ways to the on-site stormwater management systems.

Table 2. Existing and Proposed Peak Runoff

Drainage Area		DESIGN STORM EVENT / PEAK RUNOFF (cfs)			
		2-Year	10-Year	25-Year	100-Year
On-Site BVW	Existing	0.25	1.9	3.1	5.5
	Proposed	0.39	2.7	4.5	8.7
DP -2 Maple Ave	Existing	1.6	7.7	11.7	19.3
	Proposed	1.2	3.2	4.3	6.3
DP -1 * Off-Site BVW	Existing	12.7	43.8	62.9	99.6
	Proposed	10.7	38.5	58.0	96.4

* DP-1 includes all design points and reflects a hydrograph addition of peak flows

A portion of the existing Project site (116,600 square feet or 2.7 acres) contributes runoff directly to Maple Avenue along with an additional 198,000 square feet (4.5 acres) of off-site land north-east of the Project site. The Project is proposing to redirect these flows that are likely contributing to the flooding problems within Maple Avenue. A drainage trunk line is proposed to be constructed on the subject property from the two single-family homes in the northwest corner of the Project site to the existing outlet location in the southwest corner of the site (small existing detention basin). No portion of the Project (buildings or pavement) will contribute flows to this trunk line without first being treated, detained, and/or infiltrated; the trunk line will serve as overflow for a portion of the proposed stormwater management system. This proposed mitigation will remove about 7.4 cfs of contributing flow from the Maple Avenue drainage system during a 25-year design storm (11.7 cfs existing, 4.3 cfs proposed).

5.3.3 Standard #3 – Stormwater Recharge

Groundwater recharge is provided within the subsurface infiltration systems located throughout the site. The systems are designed in accordance with the MassDEP requirements and guidance provided in Volumes 2 and 3 of the Massachusetts Stormwater Standards Handbook. Where adequate offsets cannot be achieved for an infiltration system in accordance with the guidelines, subsurface detention systems will be provided (chambers or pipe and stone with a liner). The subsurface systems are designed to detain stormwater runoff from the 2, 10, 25, and 100-year design storms so that a large flow bypass will not be required.

Pretreatment structures (catch basins and stormwater treatment units) will include a bypass to properly pretreat first flush runoff prior to conveyance to the subsurface system; larger storms following the first flush will bypass the stormwater treatment unit and be conveyed directly to the subsurface systems. Catch basins, stormwater treatment units, and drain manholes will be located at all inlets and outlets and additional inspection ports are included for the long-term operation, maintenance, and inspection of the systems. Construction detailing of each system component (catch basin, stormwater treatment units, drain manholes, subsurface infiltration, subsurface detention, inspection reports, piping, etc.) will be provided in the Site Plans and

Construction Details during Town permitting including Site Plan Approval with the Planning Board and Notice of Intent with the Conservation Commission.

Test pits have been performed across the site to determine soil types and Rawls Rates where infiltration is proposed. The soils across the site and within areas of proposed infiltration facilities were sandy loams with the characteristics of Hydrologic Soil Group B, (HSG B) soils. Conservatively, for hydrologic models, no exfiltration rate was used. The Rawls Rates for Sandy Loam (1.02 in/hr) was used for determining drawdown only. The Static Method was used in determining the infiltration volume. The required volume of groundwater recharge is equal to 0.35" over the increase in impervious area on-site (686,310 sf) to approximate existing recharge on-site. As can be seen in Table 3, additional volume is provided to support groundwater recharge and to improve water quality.

Table 3. Stormwater Recharge Volumes

REQUIRED (CF)	PROVIDED (CF)
20,017	36,154

5.3.4 Standard #4 – Water Quality

Water quality measures are designed to provide a minimum of 80% Total Suspended Solids (TSS) removal (with 44% pretreatment) and to treat 1.0 inch of runoff over paved impervious areas (641,980 sf) prior to discharging to the uplands on the west side of the property. The water quality volume is achieved by providing storage volume below the outlets in the infiltration systems and through flow based treatment within the stormwater treatment units.

Over 80% TSS removal is provided through the use of one basic treatment train: deep-sump, hooded catch basins, stormwater treatment units, and subsurface infiltration systems.

5.3.5 Standard #5 – Land Uses with Higher Potential Pollutant Loads (LUHPPLs)

The proposed development is considered a land use with Higher Potential Pollutant Loads because it is expected that on-site trips per day will exceed 1,000, therefore Standard #5 is applicable. Additional pretreatment and water quality treatment are proposed along with source controls.

5.3.6 Standard #6 – Critical Areas

The proposed development is not discharging near or to a Critical Area; therefore, Standard #6 is not applicable.

5.3.7 Standard #7 – Redevelopment Project

The Project is considered a partial redevelopment project. Even so, it has been designed to meet all of the Stormwater Management Standards for new development.

5.3.8 Standard #8 – Construction Pollution Prevention and Erosion and Sedimentation Control

As the total Project area is over one acre, a Notice of Intent (NOI) must be filed with the US EPA and a Stormwater Pollution Prevention Plan (SWPPP) must be retained on-site during construction. The draft Stormwater Pollution Prevention Plan (SWPPP) is included in Appendix C – Stormwater Management Report to demonstrate compliance with the Standards. The SWPPP was developed in accordance with the 2012 NPDES Massachusetts Construction General Permit (CGP). The SWPPP outlines erosion and sedimentation control measures for the Project including installation, inspection, and maintenance of these measures through all construction phases and until all surfaces are permanently stabilized.

5.3.9 Standard #9 – Operation and Maintenance Plan

The Operation and Maintenance Plan contained in Appendix C – Stormwater Management Report describes the requisite long-term operation and maintenance of all on-site stormwater Best Management Practices (BMPs) and hydraulic drainage systems as well as source control for the prevention of pollution.

5.3.10 Standard #10 – Prohibition of Illicit Discharges

An Illicit Discharge Compliance Statement will be provided by the Applicant/Owner prior to the discharge of stormwater to post-construction BMPs.

6.0 WATER SUPPLY AND SEWAGE DISPOSAL

6.1 EXISTING CONDITIONS

6.1.1 Water Supply

A 6" municipal water main is located in the northern shoulder of Maple Avenue, opposite the Project site. In 2006, a section of the Maple Avenue water main was upgraded from six inches to twelve inches. The upgraded portion extends from the intersection of Maple Avenue and Route 9 and terminates just west of the Project site at Maple Avenue Station 52+50.

A 10" municipal water main is located in the southern shoulder of Route 9, opposite the Project site. Similar to the Maple Avenue water main improvements, a portion of the existing 10" water main was upgraded in 2006 from a 10" to a 12" main. This upgrade also was terminated just west of the Project site in Route 9.

A 12" municipal water main is located within Oak Street, extending from the intersection of Route 9 to points north of the Project site.

Based on available record drawings, the existing Chelmsford Building is serviced by a 6" lateral (domestic) from Maple Avenue and an 8" lateral (fire protection) from Route 9.

6.1.2 Sewer

An 8" gravity sewer main is located in the approximate centerline of Maple Avenue. This sewer main flows in a westerly direction toward Route 9, where it is conveyed southerly to the Rolfe Avenue Pump Station. Shrewsbury's wastewater is conveyed to and treated at the regional wastewater treatment plant in Westborough.

Based on available record drawings, the existing Chelmsford Building at 335 Maple Avenue and the single family dwelling at 315 are serviced by sewer laterals (sizes unknown) from the Maple Avenue sewer.

There is no available sewer service adjacent to the Project site within Route 9 and Oak Street. For this reason, the existing Masonic Lodge at 353 Boston Turnpike (Route 9) and the residential properties at 104, 108, and 110 Oak Street are serviced by on-site sewage disposal systems.

6.2 PROPOSED CONDITIONS

6.2.1 Water Supply

Water demand for the full build-out of the Project is estimated to be 92,300 gallons per day based on the mix of uses and design flow estimates outlined in Table 4. A small portion of the building program that was previously approved under the Phase I Waiver will be constructed in advance of the balance of the Project. This includes two, 4 bedroom single family homes (one existing) and the Masonic Lodge. These advanced Project components are estimated to generate 2,380 gallons per day.

Table 4. Water and Sewage Flows

Commercial Uses	Description	Area (sf)	314 CMR 7.00 design flow*	Average Daily Flow (gpd)
Office		198,000	75 gpd per 1,000 sf	14,850
Retail		453,000	50 gpd per 1,000 sf	22,650
Food Court	500 Seats	30,000	35 gpd per seat	17,500
Cinema	1000 seats	50,000	5 per seat	5,000
Masonic Lodge (Function Hall – Lodge)	100 seats	6,000	15 per seat	1,500
Total Commercial		737,000		61,500
Residential		Number of Bedrooms	314 CMR 7.00 design flow	Average Daily Flow (gpd)
Single Family Residential	Two 4-bedroom (one is existing)	8	110 gpd per bedroom	880
Multi-Family Residential	136, 2-bedroom	272	110 gpd per bedroom	29,920
		Total Estimated Flow (gpd) =		**92,300**

*314 CMR 7.00 design flows are equal to 310 CMR 15.00 (Title 5). Title 5 flow rates are peak rates and are equal to approximately 2 times the actual water usage.

Based on preliminary discussions with Town officials, the existing water system in Maple Avenue is not capable of providing the required fire flow for the proposed Project. Therefore, the 6" water main in Maple Avenue must be upgraded to a 12" main from approximately station 52+50 to approximately station 64+00, at the intersection of Maple Avenue and Beech Road. In addition, a new 12" loop connection is needed from Maple Avenue through the Project site, to the existing 12" water main in Oak Street. When completed, the Maple Ave upgrade and 12" loop system will provide the required fire flow for the full build-out of the Project.

The MassDOT intends to re-surface Maple Avenue along the project frontage and beyond to points north. The Proponent will continue to consult with the MassDOT and Shrewsbury Town Officials to coordinate the timing and cost of the utility improvements as well as the connection points in Maple Avenue and Oak Street.

6.2.2 Sewer

As determined by the design flow estimates listed in 314 CMR 7.15, the full-build Project is expected to generate approximately 92,300 gallons of wastewater per day (GPD) for the proposed mix of uses. However, as stated by the EPA in Onsite Wastewater Treatment Systems Manual, "most design flows provided by regulatory agencies are very conservative estimates based on peak rather than average daily flows." The EPA manual identifies a measured average daily residential flow of 60 gpd per person for homes built after 1994 compared to the 314 CMR 7.15

rate of 110 gpd per bedroom. Measured wastewater flows for restaurant uses are only slightly less than flow rates in 314 CMR 7.15, at approximately 9 gpd per customer, however retail uses are significantly less at 2 gpd per parking space plus 10 gpd per employee. Using the EPA rates, the estimated flows for the Project would be approximately 68,500 gpd.

A small portion of the building program that was previously approved under the Phase I Waiver will be constructed in advance of the balance of the Project. This includes two, 4 bedroom single family homes (one existing) and the Masonic Lodge. In accordance with 314 CMR 7.15, these advanced Project components are estimated to generate 2,380 gallons per day.

New sewer connections for the Project will be necessary at multiple locations in Maple Avenue. The Proponent will coordinate new service locations with the MassDOT and Town officials in conjunction with the aforementioned water system upgrades in Maple Avenue and the Maple Avenue resurfacing. It is anticipated that all required laterals will be installed simultaneously with the water system upgrades to avoid street openings after Maple Avenue is resurfaced. As the Project proposes to connect directly to the existing municipal sewer within Maple Avenue, no sewer extension is required or proposed.

6.3 MITIGATION AND PERMITTING STANDARDS

The Proponent is proposing several mitigation measures for the Project with regards to water use and wastewater generation.

- In accordance with Article 2, Section 2.05(e.), of the Town of Shrewsbury Board of Sewer Commissioners, Rules and Regulations for the Installation and Connection of Building Sewers and for the Use of Public Sewers, last revised December 10, 2012, (the Sewer Regulations), the Proponent will pay a connection fee of $0.50 per square foot on the area of the lot within 100 feet of a street line. The Sewer Commission may grant a 35% reduction in the fee where the Proponent's system provides enhancements beyond the minimum required.

- In accordance with Article 2, Section 2.05(g), of the Sewer Regulations, the Proponent is committed to working with the Town of Shrewsbury and the MassDEP on an infiltration and inflow (I/I) plan that helps to reduce I/I within the municipal sewer system. To that end, the Proponent will remove 4 gallons of flow for each gallon added to the system at a cost of $3.00 per gallon.

- As previously mentioned, the Maple Street water system requires certain improvements in order to satisfy the fire flow requirements for the Project. The Proponent will coordinate closely with the MassDOT and the Town of Shrewsbury in conjunction with final Project approvals to coordinate the upgrade of the 6" water main in Maple Avenue to a 12" main from approximately station 52+50 to approximately station 64+00, at the intersection of Maple Avenue and Beech Road. In addition, the Proponent will provide a new 12" loop connection from Maple Avenue through the Project site, to the existing 12" water main in Oak Street, along with easements for the benefit of the Town of Shrewsbury to own and maintain the 12" main on the Grove site.

- In accordance with the Town of Shrewsbury, Massachusetts Water Department, Rules and Regulations for Water Line Installation, last revised December 11, 2012 (the Water

Regulations), the Proponent will pay a connection fee of $4,000 per single family dwelling, $10,000 per 4-unit dwelling (plus $2,000 for each dwelling unit over 4 units), and $4,000 plus $1,000 for every 1,000 gallons per day (gpd) above 1,000 gpd, for non-residential uses.

- In accordance with the Water Regulations, the Proponent will pay a water conservation fee of $1,000 per residential connection and $1.00 per gpd for all new non-residential construction. The conservation fees are used throughout the Town for water conservation measures to reduce the consumption of water in the community to aid the Town in remaining in compliance with State water supply regulations.

- The Proponent has agreed to a number of water conservation measures in the overall design of the Project to reduce the total water use and subsequent wastewater flows from the Project and will meet the Commonwealth's Water Conservation Standards and the State Plumbing Code. These measures include:

    - Limiting use of municipal water supply to only those activities requiring potable water;
    - Installation of flow restrictors for plumbing fixtures;
    - Installation of faucets with water conserving aerators;
    - Installation of low-flow or high efficiency toilets;
    - Use of water efficient household appliances wherever possible;
    - Efficient irrigation to reduce evaporative loss and to prevent overwatering;
    - Maximization of irrigation equipment:
        - Installation of water conservation equipment including moisture sensors, rain shut-off devices, and climate-based controllers; and
        - Proper operation and maintenance of automatic irrigation system
    - Developing and implementing a water savings strategy, addressing among other items: demand management, leak detection and repair, a program of preventative maintenance, and a program of employee education; and
    - Developing and implementing seasonal demand management plans as part of a drought management plan.

Local permitting will be required for the Grove, as follows:

Local	Local Sewer Connection Permits	Water and Sewer Superintendent / Board of Sewer Commissioners	The Project requires approval for the sewer connection. The Town has indicated that sufficient capacity exists within the system.

7.0 TRANSPORTATION

The transportation study component of the Draft EIR provides an analysis of the traffic impacts, area circulation, and access impacts associated with the pro-posed mixed use development. The site abuts State Route 9, Maple Avenue, and Oak Street and will be accessed from the surrounding roadways with a total of six primary driveways: two on Route 9, two on Maple Avenue, and two on Oak Street. Two additional driveways on Maple Avenue will serve two single-family residential units and a relocate Masonic Lodge. The residential driveway is an existing driveway that will be modified to serve as a common driveway for one additional single family dwelling.

The study includes an evaluation of existing and future (No-Build and Build) traffic volume networks, roadway/site access, traffic circulation, and safety considerations. The full study is included in Appendix D – Traffic Impact and Access Study. In general, the traffic study follows guidelines established by the Massachusetts Executive Office of Energy and Environmental Affairs (EOEEA), the Massachusetts Department of Transportation (MassDOT), and the Institute of Transportation Engineers (ITE). As part of this study, a series of traffic counts were collected, safety aspects of the abutting roadway system were evaluated, forecasts of Project traffic completed, and mitigative measures were proposed. The report describes the data, analysis methods, and results of the analysis.

Since the Notice of Project Change (NPC) was filed in June 2014, consultation with MassDOT was made regarding the locations of curb cuts and site drives. In January 2015, a meeting was held to discuss the driveways proposed along Maple Avenue and Route 9. It was agreed that the Masonic Lodge should be served by its own driveway. Discussion was also made of the number of entry and exit drives along Route 9 and of deceleration and acceleration lanes provided in association with the Route 9 driveways.

7.1 EXISTING CONDITIONS

Existing conditions were examined over a broad study area extending east and west along Route 9 from the Project site and north to Shrewsbury Center.

7.1.1 Study Area

The study area has been expanded from the study area in the Traffic Impact & Access Report that was previously included with the Environmental Notification Form (ENF). The study area now includes the following intersections (with new locations noted):

- Route 9 (Boston Worcester Turnpike) at Harrington Avenue/Svenson Road
- Route 9 at Maple Avenue
- Route 9 at Oak Street
- Route 9 at Lake Street
- Maple Avenue at Old Mill Road
- Maple Avenue at Gale Avenue
- Maple Avenue at Oak Street
- Oak Street at Beverly Hill Drive
- Oak Street at Howe Avenue

- Oak Street at Oak Middle School South Driveway
- Oak Street at Oak Middle School North Driveway
- Oak Street at Gale Avenue
- Maple Avenue at Main Street (New)
- Main Street at Route 140 (New)
- Old Mill Road at Harrington Avenue (New)
- Main Street at Old Mill Road (New)

The four additional study intersections were added to the study to gain an understanding of traffic operations at intersections as vehicles travel between Shrewsbury town center and the Project site (along Maple Avenue), and as vehicles travel between I-290 and the Project site (along Maple Avenue, Old Mill Road, and Main Street). We do not anticipate that any site-generated traffic would use Beach Road, Elm Street, or Bailey Road to travel to/from the Project site, and therefore have not included these roadways in the expanded study area. Figure 14 shows the complete study area.

Figure 14. Study Area Intersections

7.1.2 Traffic Conditions

Traffic data were collected during September 2013 and January 2015 as part of this study. The data collection consisted of both 48-72 hour automatic traffic recorder (ATR) counts and manual peak period turning movement counts (TMC) at the study intersections. The 48 hour ATR on Route 9 included one weekday and Saturday counts and the 72 hour ATR on Maple Avenue

and Oak Street were for two weekdays and one Saturday count. The TMC data were collected between 7 AM and 9 AM and 4 PM and 6 PM on a typical weekday, and between 11 AM and 1 PM on a typical Saturday.

The average weekday traffic volume on Route 9 east of Oak Street is approximately 39,025 vehicles per day (vpd), with approximately 2,700 vpd and 3,090 vpd in the AM and PM peak hour, respectively. The direction of travel is approximately equal between eastbound and westbound traffic. Maple Avenue north of Beach Road carries approximately 4,840 vpd. During the AM peak hour, the volume on Maple Avenue north of Beach Road was approximately 325 vehicles, with 59% traveling in the southbound direction. There were approximately 390 vehicles in the PM peak with a 50% split in both northbound and southbound directions. Data collected on Oak Street show approximately 3,835 vpd. In the AM peak hour, there are approximately 420 vpd with 62% in northbound direction, and approximately 370 vpd during PM peak hour traffic, split approximately equally between northbound and southbound traffic. Figure 15, Figure 16, and Figure 17 illustrate the existing peak hour traffic volume networks for the weekday morning and afternoon peak hours and the Saturday Midday peak hour, respectively. Note that some minor adjustments were made to balance the traffic volumes between intersections. Further discussion of traffic volumes and traffic speeds can be found in Appendix D – Traffic Impact and Access Study.

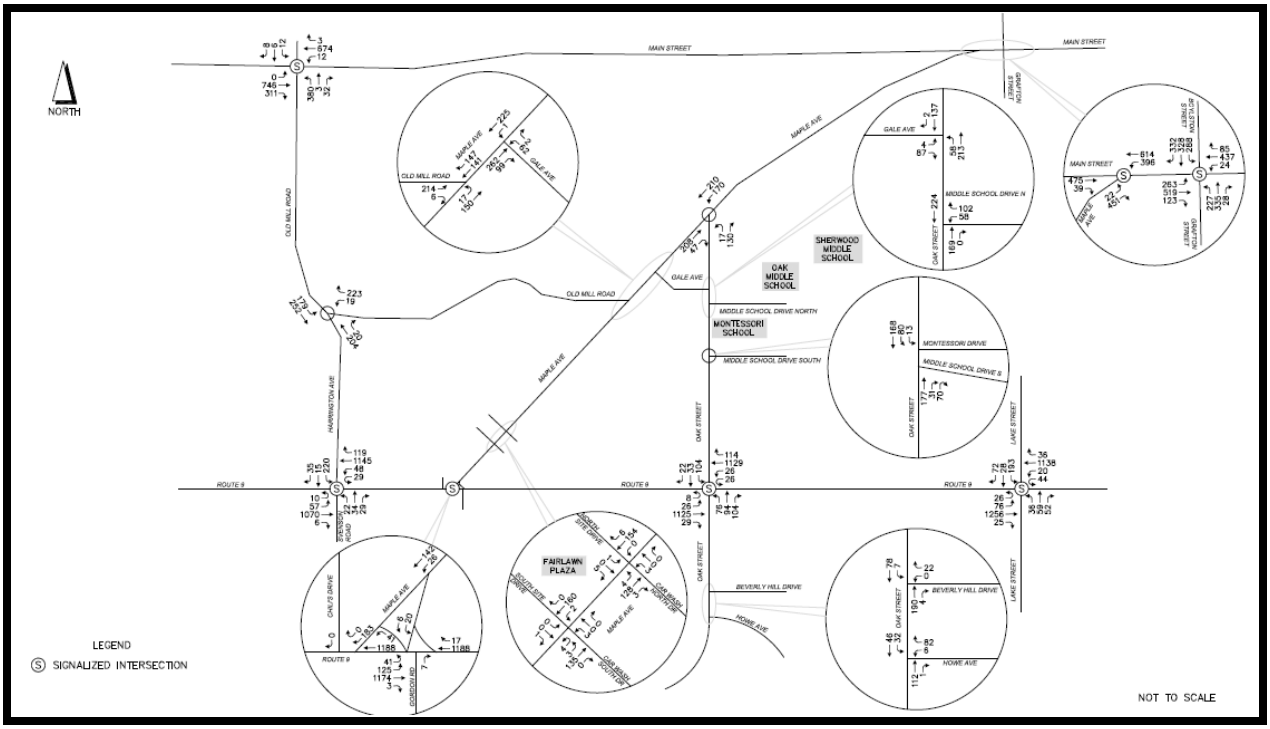


Figure 15. Existing AM Peak Hour Traffic Volumes*

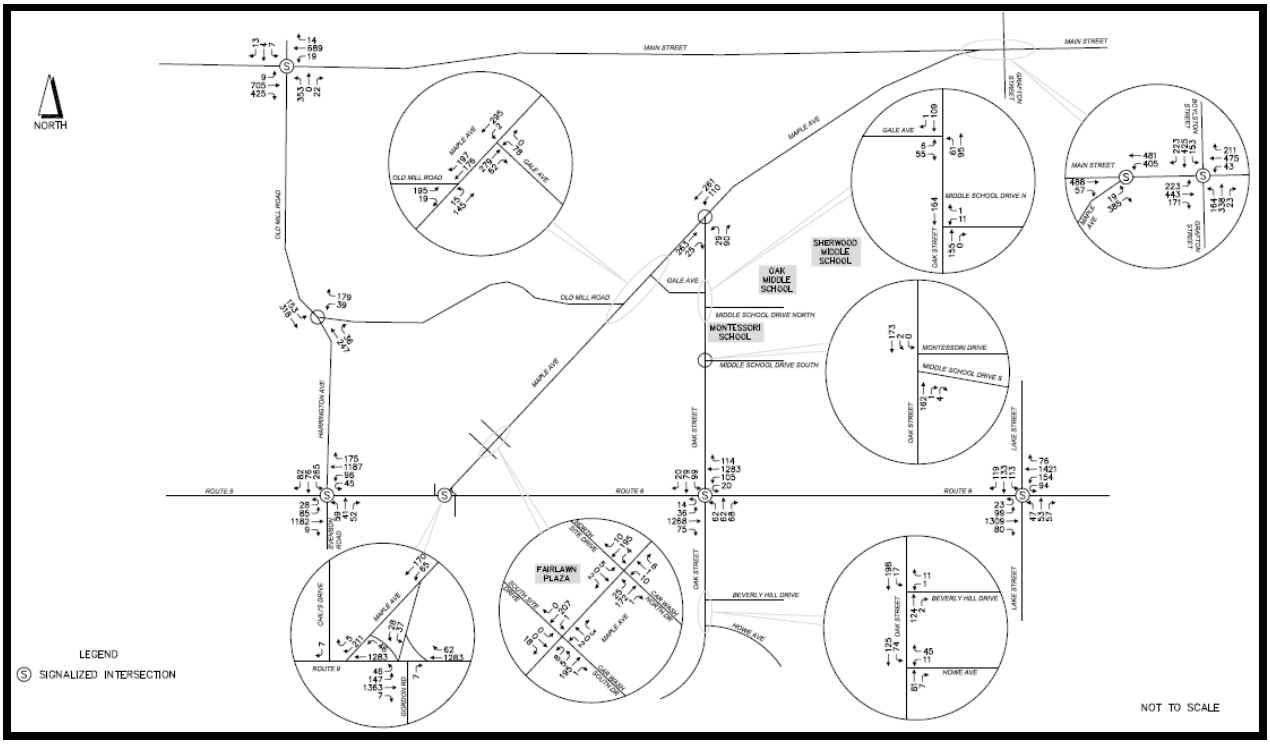


Figure 16. Existing PM Peak Hour Traffic Volumes*

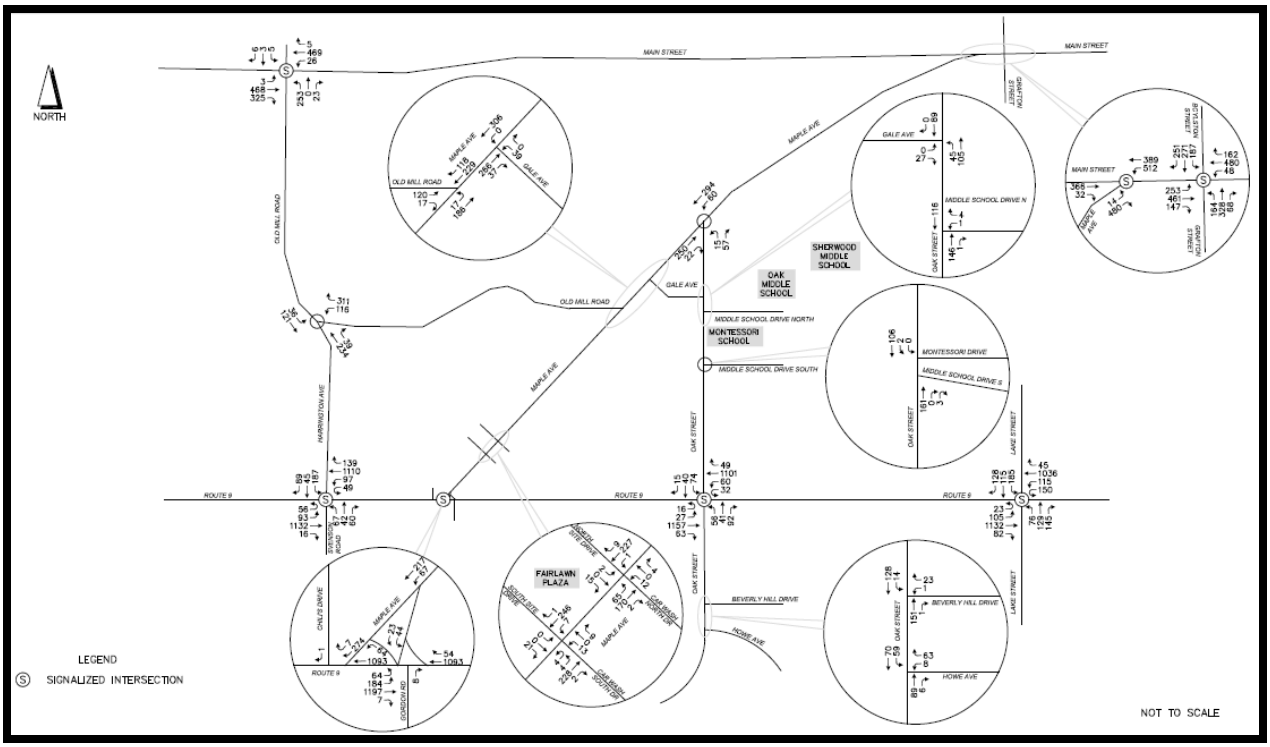


Figure 17. Existing Saturday Peak Hour Traffic Volumes*

Crash history was compiled and reviewed for the study locations for the period from 2010 to 2012. The review was completed for all study intersections. Accident data for the Town of Shrewsbury were obtained from the MassDOT Crash Record System (CRS), which is compiled with information from the Registry of Motor Vehicles (RMV). As part of this safety review, the crash rate for the study intersections was also determined. The calculation of the crash rate accounts for the amount of traffic that enters the intersection, and relates the number of accidents at a location directly to the amount of traffic that passes through the location. It is a more meaningful measure for identifying potentially hazardous locations than simple averages. The calculated rate at each location was compared to the MassDOT District 3 averages (which includes the Town of Shrewsbury). Intersections experiencing crash rates greater than the averages may warrant further investigation or improvements. The average crash rates for MassDOT District 3 are 0.66 crashes per million entering vehicles (MEV) for unsignalized intersections and 0.89 crashes per MEV for signalized intersections. Table 5 summarizes the results.

Table 5. Intersection Crash Rates

Intersection	Type of Control	Total No. of Crashes (3 Years)	Average No. of Crashes/Yr	Crash Rate (per MEV)	Exceed MHD Rate[1]
Route 9 at Harrington Avenue/Svenson Road	Signalized	45	15.0	0.96	Yes
Route 9 at Maple Avenue	Signalized	44	14.7	1.02	Yes
Route 9 at Oak Street	Signalized	41	13.7	0.90	Yes
Route 9 at Lake Street	Signalized	33	11.0	0.63	No
Main Street at Old Mill Road	Signalized	27	9.0	0.89	No
Main Street at Maple Avenue	Signalized	36	12.0	1.54	Yes
Main Street at Grafton Street/ Boylston Street	Signalized	37	12.3	0.96	Yes
Harrington Avenue at Old Mill Road	Unsignalized	10	3.3	0.76	Yes
Maple Avenue at Old Mill Road	Unsignalized	2	0.7	0.20	No
Maple Avenue at Oak Street	Unsignalized	5	1.7	0.52	No
Oak Street at Beverly Hill Drive	Unsignalized	1	0.3	0.25	No
Oak Street at Beverly Hill Drive	Unsignalized	0	0.0	0.00	No

[1] Based on MassDOT District 3 average crash rate: unsignalized 0.66; signalized 0.89

As indicated in Table 5, six of the study intersections experienced a higher than average crash rate (with an additional intersection equaling the MassDOT District 3 crash rate). The intersection with the highest crash rate in the study area is the signalized intersection of Main Street at Maple Avenue. Angle collisions and rear-end collisions each comprise approximately one-third of all reported accidents at this intersection. Angled collisions are frequent because Maple Ave-

nue is skewed about 55 degrees from perpendicular to Main Street and because keeping eastbound along Main Street entails taking a left at the intersection. Weaving maneuvers between the two travel lanes provided in each direction on Main Street/Maple Avenue may also contribute to accidents. The one unsignalized intersection with a greater-than-district-average crash rate, Old Mill Road at Harrington Avenue, also is a skewed three-way intersection. At the intersection of Route 9 and Maple Avenue, 82% of crashes are rear-ends. This is potentially due to signal timing and travel speeds on Route 9. Similarly at Route 9 and Harrington Road/Svenson Road, a large proportion of crashes (56%) were rear-end type and could be due to unexpected stops at the signal, as could be true with other intersections that experienced many rear-end collisions. For additional details on crash history in the study area, please refer to Appendix D – Traffic Impact and Access Study.

7.1.3 Transit, Pedestrian, and Bicycle Access

Existing alternative-mode access to the site is shown in Figure 18. Existing sidewalks are present along Route 9 and along the sides of Maple Avenue and Oak Street opposite of the site. Except for along Fairlawn Plaza along Maple Avenue, the existing sidewalks are bituminous. The sidewalk along Maple Avenue extends to Shrewsbury Town Center. The sidewalk along Route 9 is at one portion level with the roadway.

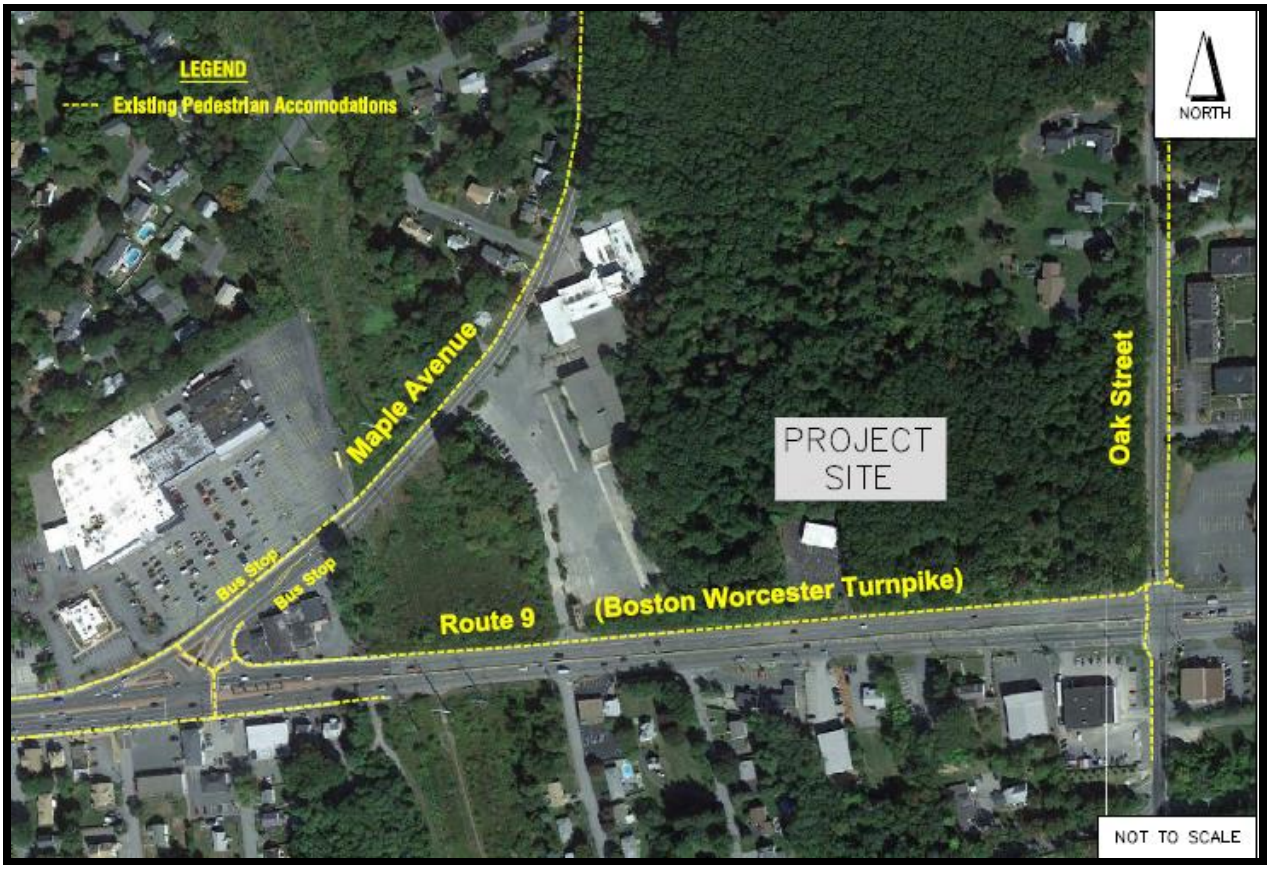


Figure 18. Existing Transit, Pedestrian, and Bicycle Access

There are no specialized existing bicycle amenities in the vicinity of the site. Currently, there is a bus stop serving the Worcester Regional Transit Authority (WRTA) bus Route 15 on each side of Maple Avenue about 500 feet south of the Project site.

7.2 PROPOSED CONDITIONS

The addition of the Grove will add trips to the study area network, affect the level of service at some intersections, and lead to the need for mitigation at a few locations.

7.2.1 Trip Generation and Distribution

In order to estimate the number of trips that could be generated by the proposed mixed-use development, statistics published by the Institute of Transportation Engineers (ITE) in Trip Generation for similar land uses were examined. The ITE trip generation statistics represent compilations of data from studies and projects throughout the United States collected over the past 30+ years on trip generation characteristics for different types of land uses. The data have been compiled to provide transportation analysts with reliable guidelines in forecasting 24 hour and peak hour volumes for the specified use.

Based on a review of the ITE database and the various models, Land Use Code (LUC) 820 Shopping Center, LUC 710 General Office Building, LUC 444 Movie Theater with Matinee, LUC 932 High Turnover (Sit-Down) Restaurant, LUC 210 Single Family Detached Housing, and LUC 220 Apartments were selected as the most similar to the project types of uses. Pass-by and Diverted trip rates were determined for the retail and restaurant space and internal capture was determined between retail, restaurant space, and office space. These were determined to best reflect the Project's travel characteristics and were selected for estimating purposes.

In order to estimate the level of internal trips, the data and methodologies of both the ITE Trip Generation Handbook[1] and the National Cooperative Highway Research Program (NCHRP) Report 684: Enhancing Internal Trip Capture Estimation for Mixed-Use Developments[2] were used. The ITE Trip Generation Handbook was used for estimating the internal trips during the weekday and Saturday daily periods, while NCHRP Report 684 was used to estimate the internal trips during the weekday and Saturday peak periods. Based on the data and methodologies contained in these documents, it was estimated that the overall site would experience an internal trip rate of approximately 25% during the weekday morning peak hour, 20% during the weekday afternoon peak hour, and 15% during a typical weekday. Similarly, it was estimated that the Project site would experience an internal trip rate of approximately 18% during the Saturday peak period, and 13% during a typical Saturday.

For retail land uses, pass-by/diverted trip rates of 34% for during weekdays and 26% on Saturday were used. The calculated pass-by/diverted trips were then compared to adjacent street traffic volumes on Route 9, Maple Avenue, and Oak Street, as MassDOT's current policy does not allow the total number of pass-by/diverted trips to exceed 15% of the adjacent street traffic. Our analyses indicated that the 26% pass-by/diverted trip rate on Saturday exceeded this 15% threshold. Therefore, the Saturday pass-by/diverted trip rates were then lowered to be equal to

[1] Trip Generation Manual Handbook, 9th Edition, Institute of Transportation Engineers, 2012

[2] NCHRP Report 684: Enhancing Internal Trip Capture Estimation for Mixed-Use Developments, Transportation Research Board, 2011

15% of all adjacent street traffic, which resulted in an effective pass-by/diverted trip rate of 22.3% and 24.8% during the Saturday peak hour and Saturday daily period, respectively.

As shown in Table 6, the proposed fully-occupied development is expected to generate a total of approximately 17,830 new vehicle trips over the course of an average weekday and approximately 24,122 new vehicle trips over the course of a typical Saturday. The weekday morning peak hour is expected to generate 722 total new trips with 521 inbound and 201 outbound trips. The weekday evening peak hour is expected to generate 1,470 total new trips with 608 inbound and 862 outbound trips. Saturday midday peak hour is expected to generate 2,123 total new trips with 1,143 inbound and 980 outbound trips.

Table 6. Trip Generation

Weekday								**Saturday**			
	AM			**PM**			**Daily**	**Midday**			**Daily**
	In	**Out**	**Total**	**In**	**Out**	**Total**	**Total**	**In**	**Out**	**Total**	**Total**
Retail											
Total	270	165	435	792	857	1,649	18,130	1,214	1,120	2,334	23,934
Pass-by/Diverted	70	70	140	257	257	514	6,002	247	247	494	5,876
Internal Capture	12	12	24	76	61	137	474	62	62	124	246
New Trips	188	83	271	459	539	998	11,654	905	811	1,716	17,812
Office											
Total	291	40	331	51	249	300	2,206	46	39	85	488
Internal Capture	13	11	24	19	47	66	224	-	-	-	-
New Trips	278	29	307	32	202	234	1,982	46	39	85	488
Cinema											
Total	-	-	-	65	97	162	2,788	167	111	278	4,376
Internal Capture	-	-	-	17	24	41	74	45	50	95	174
New Trips	-	-	-	48	73	121	2,714	122	61	183	4,202
Food Court											
Total	178	146	324	178	118	296	3,816	224	198	422	4,752
Internal Capture	137	112	249	137	91	228	2,938	172	152	324	3,658
New Trips	41	34	75	41	27	68	878	52	46	98	1,094
Residences											
Total	14	57	71	61	32	93	956	35	35	70	796
Internal Capture	0	2	2	32	12	44	354	18	13	31	290
New Trips	14	55	69	28	21	49	582	18	23	41	506
Net New Traffic	521	201	722	608	862	1,470	17,830	1,143	980	2,123	24,122

Source: ITE Trip Generation, 9th Edition, 2012

Once the number of trips projected to be generated by the development has been determined, trips are assigned to the site driveway and study area roadways based on trip distribution patterns determined for the Project. For this Project, directional distribution of generated trips to and from the site is expected to follow existing traffic patterns, which in turn, are a function of regional population densities, shopping opportunities, areas of employment, and recreational

activities. As a result of the analysis, the assigned percentages by direction and for each analysis period were developed and are presented in Figure 19 through Figure 21 for residential, office, and retail trips, respectively.

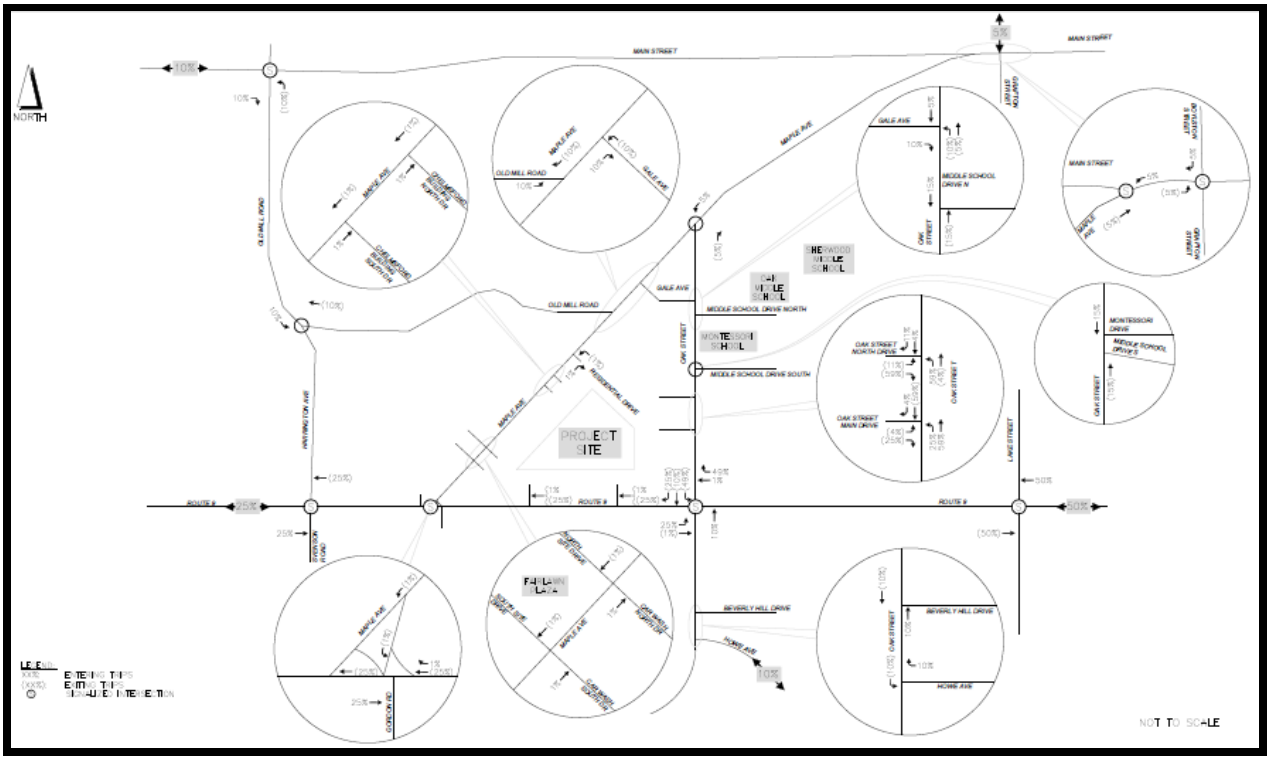


Figure 19. Trip Distribution Residential*

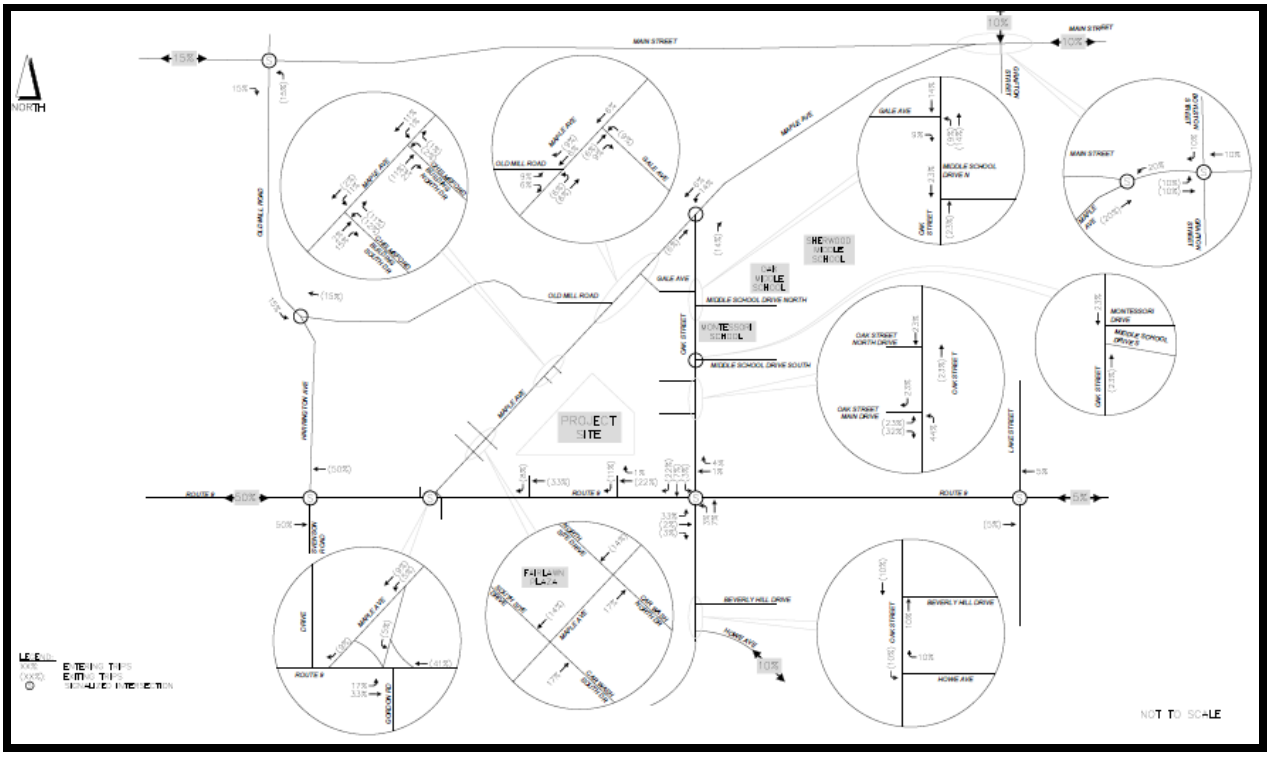


Figure 20. Trip Distribution Office*

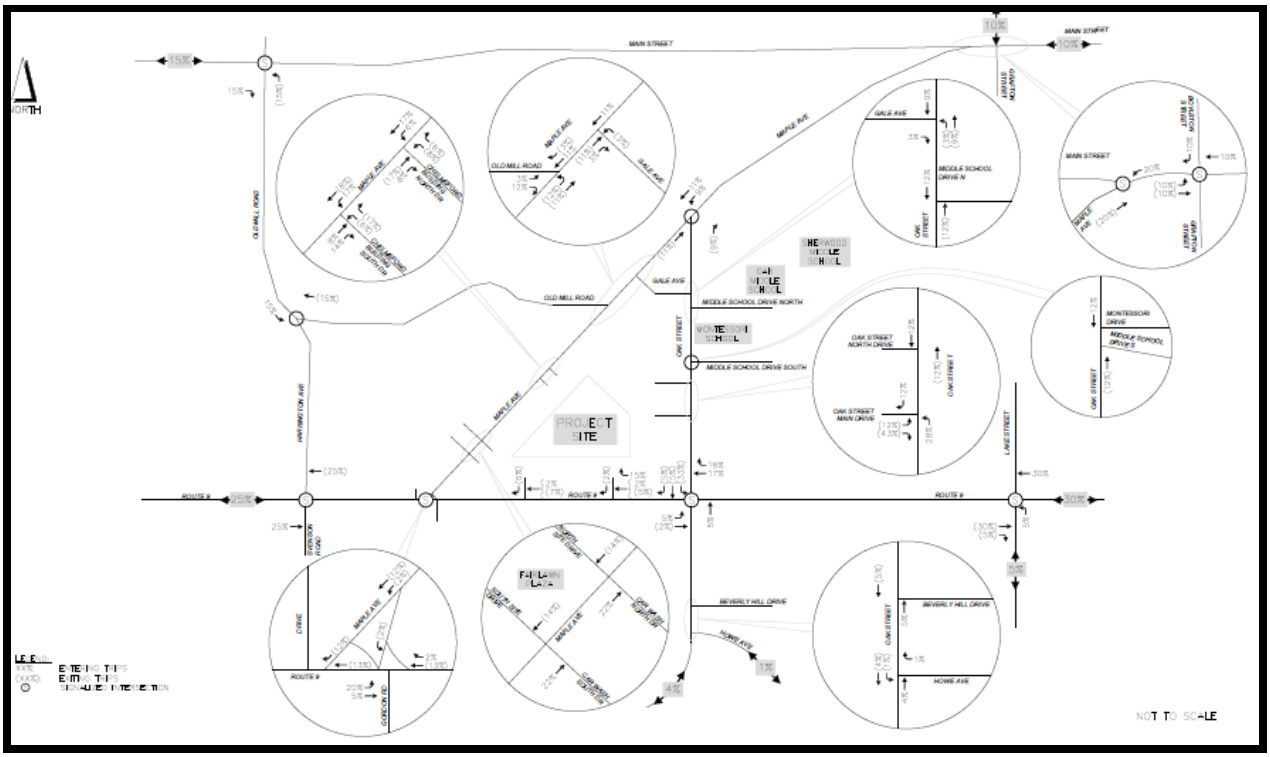


Figure 21. Trip Distribution Retail*

Peak hour site traffic volumes based upon the assigned distributions were added to the No-Build traffic volumes to establish the 2022 Build condition traffic networks. Figure 22 though Figure 24 present the Full Build traffic volumes for the weekday morning, afternoon, and Saturday peak hours, respectively. Further discussion of how the No-Build and Build condition volumes were calculated can be found in Appendix D – Traffic Impact and Access Study.

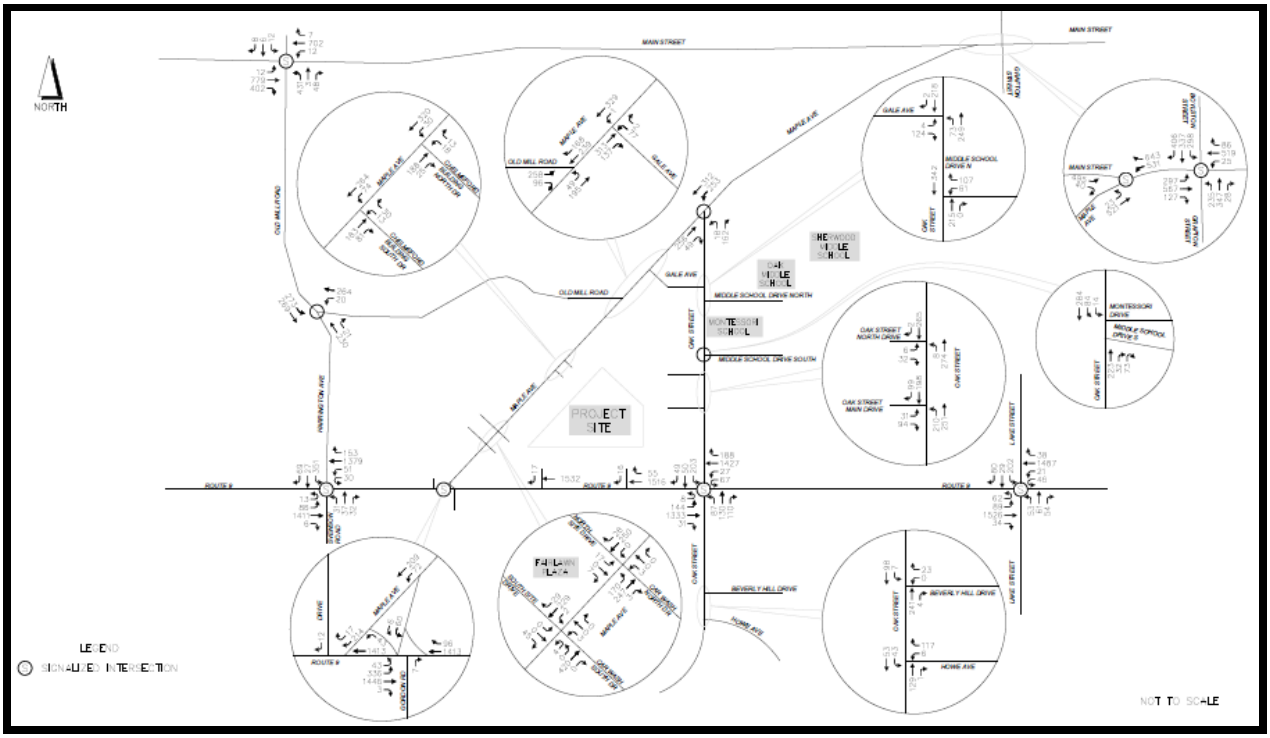


Figure 22. 2022 Full Build Traffic Volumes AM Peak Hour*

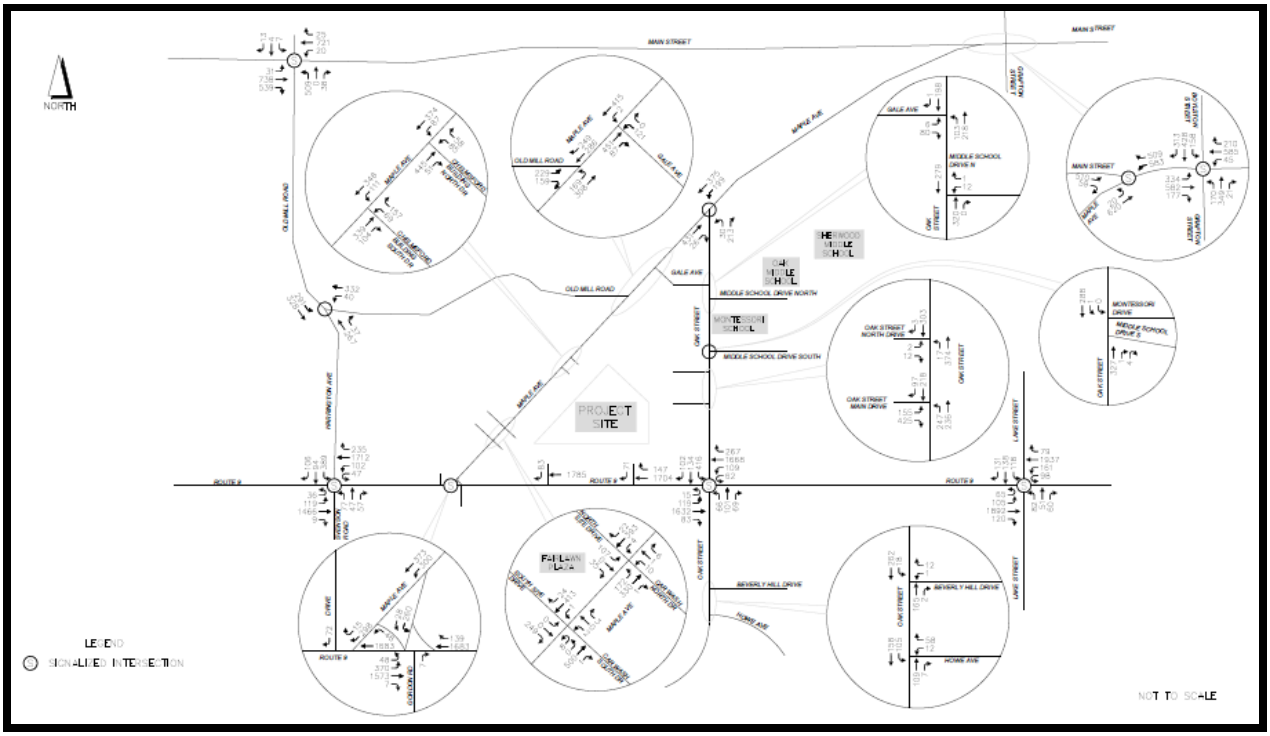


Figure 23. 2022 Full Build Traffic Volumes PM Peak Hour*

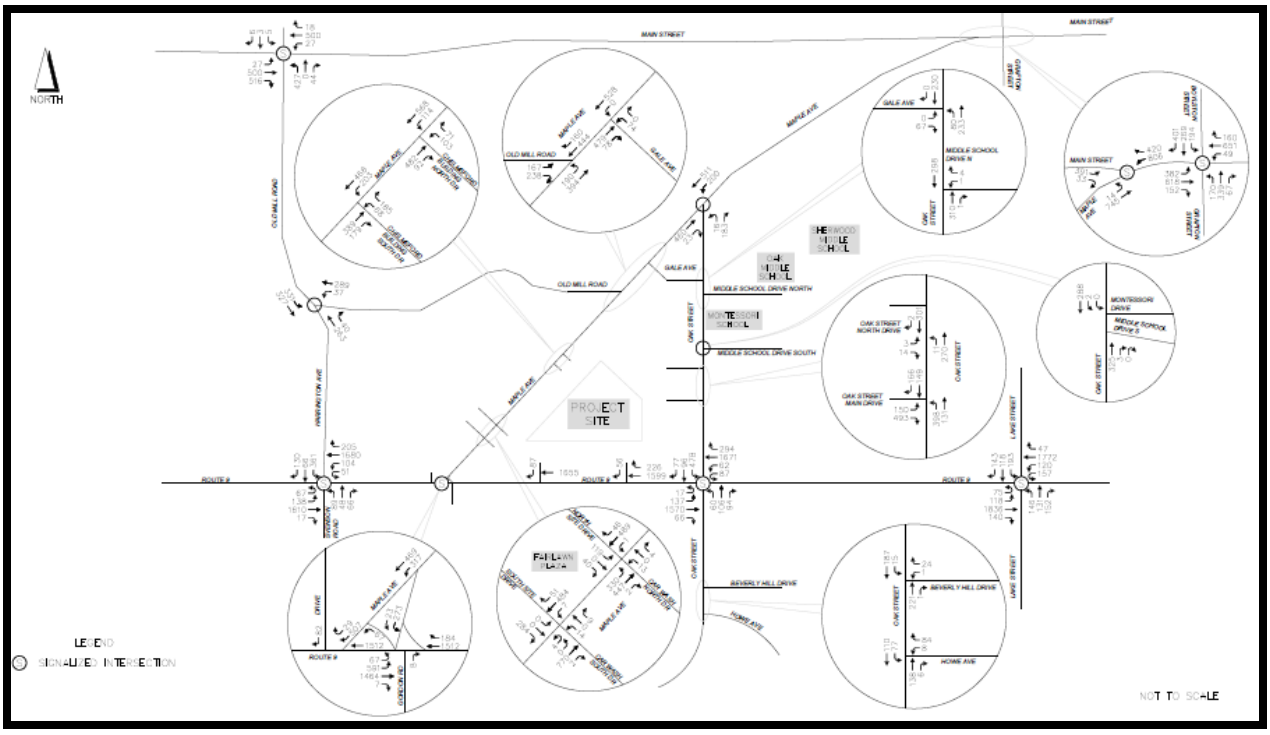


Figure 24. 2022 Full Build Traffic Volumes Saturday Peak Hour*

7.2.2 Intersection Level of Service

For this analysis, the study intersections in the vicinity of the Project were examined with regard to flow rates, capacity, and delay characteristics to determine the Level of Service (LOS) provided under existing and future (No-Build and Build) traffic conditions. Level of Service is an indicator of operating conditions which occur on a given roadway feature while accommodating varying levels of traffic volumes. It is a qualitative measure that accounts for a number of operational factors including roadway geometry, speed, traffic composition, peak hour factors, travel delay, freedom to maneuver, and driver expectation. When all of these measures are assessed and a Level of Service is assigned to a roadway or intersection, it is equivalent to presenting an "index" to the operational qualities of the section under study. Level of Service is classified in the Highway Capacity Manual (HCM) into six levels that are designated A through F based on the control delay ranges they fall under.

In practice, any given roadway/intersection may operate at a wide LOS range depending upon time of day, day of week or period of year. It should be noted that for unsignalized intersections, the Level of Service is not computed for the intersection as a whole. Instead, the level of service is determined by the computed or measured control delay for each individual critical movement.

The study intersections were evaluated using the Synchro 8 computer models that follows the procedures established in the HCM. Using existing roadway features and intersection controls, traffic operations at the study intersections were evaluated for existing as well as future conditions. Analysis results for the study intersections for the Full Build scenario are presented in Table 7 through Table 9 for weekday morning, weekday afternoon, and Saturday midday peak period, respectively. Overall LOS is presented for signalized intersections are summarized; side street LOS are presented for unsignalized intersections, since these represent the approaches with the longest delays.

Table 7. Full Build Level of Service AM Peak Hour

	Existing Conditions				Future No-Build				Future Build Conditions			
	v/c	Delay	LOS	95th*	v/c	Delay	LOS	95th*	v/c	Delay	LOS	95th*
Route 9 at Harrington Ave/ Svenson Rd		**35.1**	**D**			**65.2**	**E**			**92.6**	**F**	
Route 9 at Maple Avenue		**9.1**	**A**			**13.6**	**B**			**19.9**	**B**	
Route 9 at Oak Street		**34.0**	**C**			**44.9**	**D**			**> 120**	**F**	
Route 9 at Lake Street		**19.5**	**B**			**19.7**	**B**			**20.8**	**C**	
Maple Ave at Old Mill Road												
Old Mill Road EB Left	0.47	17.1	C	63	0.61	24.8	C	98	0.88	56.3	F	210
Old Mill Road EB Right	0.01	9.2	A	0	0.06	9.8	A	5	0.16	10.7	B	13
Maple Ave at Gale Ave												
Gale Ave WB Left/Right	0.21	16.1	C	20	0.25	18.8	C	25	0.34	22.9	C	38
Maple Ave at Oak Street												
Oak Street NB Left/Right	0.40	16.5	C	48	0.50	20.7	C	68	0.74	39.0	E	140

	Existing Conditions				Future No-Build				Future Build Conditions			
	v/c	Delay	LOS	95th*	v/c	Delay	LOS	95th*	v/c	Delay	LOS	95th*
Main Street at Old Mill Road		**69.6**	**E**			**36.2**	**D**			**38.5**	**D**	
Main Street at Maple Avenue		**16.6**	**B**			**16.7**	**B**			**16.8**	**B**	
Main Street at Route 140		**> 120**	**F**			**> 120**	**F**			**> 120**	**F**	
Old Mill Road at Harrington Avenue												
Harrington Ave NB Left/Right	0.58	23.9	C	90	0.69	30.9	D	125	0.82	48.7	E	178
Oak Street at Gale Ave												
Gale Ave EB Left/Right	0.19	10.7	B	18	0.21	11.4	B	20	0.33	13.2	B	35
Oak Street at Oak Middle School North Drive												
Middle School North Drive WB Left/Right	0.30	12.2	B	31	0.48	16.8	B	65	0.58	22.7	C	90
Oak Street at Oak Middle School South Drive												
Middle School South Drive WB Left/Right	-	-	A	-	-	-	A	-	-	-	A	-
Oak Street at Beverly Hill Drive												
Beverly Hill Drive WB Left/Right	0.04	9.7	A	3	0.04	9.8	A	3	0.04	10.1	B	3
Oak Street at Howe Avenue												
Howe Ave WB Left/Right	0.13	9.7	A	10	0.13	9.8	A	13	0.18	10.1	B	18
Route 9 at West Site Driveway												
West Site Driveway SB Right	-	-	-	-	-	-	-	-	0.06	17.3	C	5
Route 9 at East Site Driveway												
East Site Driveway SB Right	-	-	-	-	-	-	-	-	0.06	17.1	C	5
Maple Ave at Chelmsford Bldg. North Driveway												
Maple Ave SB Left/Thru	-	-	-	-	-	-	-	-	0.06	12.1	B	5
Chelmsford Bldg. North Driveway WB Left/Right	-	-	-	-	-	-	-	-	0.03	7.9	A	3
Maple Ave at Chelmsford Bldg. South Driveway												
Maple Ave SB Left/Thru	-	-	-	-	-	-	-	-	0.08	11.5	B	8
Chelmsford Bldg. South Driveway WB Left/Right	-	-	-	-	-	-	-	-	0.07	8.1	A	5

	Existing Conditions				Future No-Build				Future Build Conditions			
	v/c	Delay	LOS	95th*	v/c	Delay	LOS	95th*	v/c	Delay	LOS	95th*
Oak Street at Residential Site Driveway												
Oak Street NB Left/Thru	-	-	-	-	-	-	-	-	0.06	10.6	B	5
Chelmsford Bldg. South Driveway EB Left/Right	-	-	-	-	-	-	-	-	0.01	7.9	A	0
Oak Street at Major Site Driveway												
Oak Street NB Left/Thru	-	-	-	-	-	-	-	-	0.19	8.6	A	18
Commercial Site Driveway EB Left	-	-	-	-	-	-	-	-	0.16	25.3	D	15
Commercial Site Driveway EB Right	-	-	-	-	-	-	-	-	0.13	10.4	B	13

Table 8. Full Build Level of Service PM Peak Hour

	Existing Conditions				Future No-Build				Future Build Conditions			
	v/c	Delay	LOS	95th*	v/c	Delay	LOS	95th*	v/c	Delay	LOS	95th*
Route 9 at Harrington Ave/ Svenson Rd		**36.7**	**D**			**73.8**	**E**			**> 120**	**F**	
Route 9 at Maple Avenue		**9.8**	**A**			**27.6**	**C**			**53.3**	**D**	
Route 9 at Oak Street		**22.7**	**C**			**27.9**	**C**			**> 120**	**F**	
Route 9 at Lake Street		**34.7**	**C**			**47.0**	**D**			**61.9**	**E**	
Maple Ave at Old Mill Road												
Old Mill Road EB Left	0.34	13.8	B	38	0.52	21.7	C	73	1.10	> 120	F	280
Old Mill Road EB Right	0.02	9.3	A	3	0.07	9.8	A	5	0.24	11.5	B	23
Maple Ave at Gale Ave												
Gale Ave WB Left/Right	0.26	16.3	C	25	0.33	20.2	C	35	0.63	37.9	E	98
Maple Ave at Oak Street												
Oak Street NB Left/Right	0.24	13.6	B	25	0.31	16.0	C	33	0.67	30.1	D	120
Main Street at Old Mill Road		**63.5**	**E**			**53.1**	**D**			**88.1**	**F**	
Main Street at Maple Avenue		**20.6**	**C**			**21.4**	**C**			**21.4**	**C**	
Main Street at Route 140		**55.5**	**E**			**68.2**	**F**			**99.8**	**F**	
Old Mill Road at Harrington Avenue												
Harrington Ave NB Left/Right	0.77	37.8	E	160	0.90	57.7	F	230	1.38	> 120	F	455
Oak Street at Gale Ave												
Gale Ave EB Left/Right	0.07	9.6	A	5	0.08	9.7	A	8	0.13	10.8	B	10
Oak Street at Oak Middle School North Drive												
Middle School North Drive WB Left/Right	0.04	11.1	B	3	0.04	11.4	B	3	0.07	14.9	B	5
Oak Street at Oak Middle School South Drive												
Middle School South Drive WB	0.00	7.6	A	0	0.00	7.7	A	0	0.00	8.1	A	0

	Existing Conditions				Future No-Build				Future Build Conditions			
	v/c	Delay	LOS	95th*	v/c	Delay	LOS	95th*	v/c	Delay	LOS	95th*
Left/Right												
Oak Street at Beverly Hill Drive												
Beverly Hill Drive WB Left/Right	0.03	9.2	A	3	0.03	9.3	A	3	0.03	9.5	A	3
Oak Street at Howe Avenue												
Howe Ave WB Left/Right	0.08	9.7	A	8	0.09	9.8	A	8	0.11	10.2	B	10
Route 9 at West Site Drive-way												
West Site Driveway SB Right	-	-	-	-	-	-	-	-	0.36	26.9	D	38
Route 9 at East Site Driveway												
East Site Driveway SB Right	-	-	-	-	-	-	-	-	0.29	23.5	C	28
Maple Ave at Chelmsford Bldg. North Driveway												
Maple Ave SB Left/Thru	-	-	-	-	-	-	-	-	0.09	8.8	A	0.3
Chelmsford Bldg. North Driveway WB Left/Right	-	-	-	-	-	-	-	-	0.56	33.6	D	3.2
Maple Ave at Chelmsford Bldg. South Driveway												
Maple Ave SB Left/Thru	-	-	-	-	-	-	-	-	0.11	8.7	A	10
Chelmsford Bldg. South Driveway WB Left/Right	-	-	-	-	-	-	-	-	0.62	27.6	D	100
Oak Street at Residential Site Driveway												
Oak Street NB Left/Thru	-	-	-	-	-	-	-	-	0.02	10.9	B	3
Chelmsford Bldg. South Driveway EB Left/Right	-	-	-	-	-	-	-	-	0.02	8	A	0
Oak Street at Major Site Driveway												
Oak Street NB Left/Thru	-	-	-	-	-	-	-	-	0.2	8.8	A	20
Commercial Site Driveway EB Left	-	-	-	-	-	-	-	-	0.94	105.1	F	183
Commercial Site Driveway EB Right	-	-	-	-	-	-	-	-	0.62	17.2	C	108

Table 9. Full Build Level of Service Saturday Peak Hour

	Existing Conditions				Future No-Build				Future Build Conditions			
	v/c	Delay	LOS	95th*	v/c	Delay	LOS	95th*	v/c	Delay	LOS	95th*
Route 9 at Harrington Ave/ Svenson Rd		**33.1**	**C**			**75.7**	**E**			**> 120**	**F**	
Route 9 at Maple Avenue		**10.9**	**B**			**24.3**	**C**			**111.3**	**F**	
Route 9 at Oak Street		**13.4**	**B**			**17.2**	**B**			**> 120**	**F**	
Route 9 at Lake Street		**58.3**	**E**			**78.6**	**E**			**103.1**	**F**	

	Existing Conditions				Future No-Build				Future Build Conditions			
	v/c	Delay	LOS	95th*	v/c	Delay	LOS	95th*	v/c	Delay	LOS	95th*
Maple Ave at Old Mill Road												
Old Mill Road EB Left	0.29	0.29	14.8	30	0.50	27.1	D	65	1.82	> 120	F	405
Old Mill Road EB Right	0.03	0.03	9.7	3	0.12	10.9	B	10	0.50	17.3	C	70
Maple Ave at Gale Ave												
Gale Ave WB Left/Right	0.13	14.2	B	10	0.18	18.1	C	15	0.46	33.5	D	55
Maple Ave at Oak Street												
Oak Street NB Left/Right	0.19	12.0	B	18	0.21	14.7	B	20	0.65	32.3	D	108
Main Street at Old Mill Road		**17.8**	**B**			**18.9**	**B**			**25.9**	**C**	
Main Street at Maple Avenue		**> 120**	**F**			**> 120**	**F**			**> 120**	**F**	
Main Street at Route 140		**49.8**	**D**			**63.5**	**E**			**93.1**	**F**	
Old Mill Road at Harrington Avenue												
Harrington Ave NB Left/Right	0.04	8.5	A	3	0.05	8.7	A	3	0.06	9.4	A	5
Oak Street at Gale Ave												
Gale Ave EB Left/Right	0.05	9.2	A	5	0.05	9.3	A	5	0.16	11.4	B	15
Oak Street at Oak Middle School North Drive												
Middle School North Drive WB Left/Right	0.01	9.9	A	0	0.01	10.1	B	0	0.02	12.9	B	3
Oak Street at Oak Middle School South Drive												
Middle School South Drive WB Left/Right	0.00	7.7	A	0	0.00	7.8	A	0	0.00	8.4	A	0
Oak Street at Beverly Hill Drive												
Beverly Hill Drive WB Left/Right	0.04	9.5	A	3	0.05	9.6	A	3	0.05	10.2	B	5
Oak Street at Howe Avenue												
Howe Ave WB Left/Right	0.12	9.6	A	10	0.13	9.7	A	10	0.17	10.4	B	15
Route 9 at West Site Drive-way												
West Site Driveway SB Right	-	-	-	-	-	-	-	-	0.34	24.1	C	35
Route 9 at East Site Driveway												
East Site Driveway SB Right	-	-	-	-	-	-	-	-	0.21	20.3	C	20
Maple Ave at Chelmsford Bldg. North Driveway												
Maple Ave SB Left/Thru	-	-	-	-	-	-	-	-	0.13	9.3	A	10
Chelmsford Bldg. North Driveway WB Left/Right	-	-	-	-	-	-	-	-	1.10	> 120	F	240
Maple Ave at Chelmsford Bldg. South Driveway												
Maple Ave SB Left/Thru	-	-	-	-	-	-	-	-	0.23	9.8	A	23
Chelmsford Bldg. South Driveway WB Left/Right	-	-	-	-	-	-	-	-	1.14	> 120	F	313

	Existing Conditions				Future No-Build				Future Build Conditions			
	v/c	Delay	LOS	95th*	v/c	Delay	LOS	95th*	v/c	Delay	LOS	95th*
Oak Street at Residential Site Driveway												
Oak Street NB Left/Thru	-	-	-	-	-	-	-	-	0.01	7.9	A	0
Chelmsford Bldg. South Driveway EB Left/Right	-	-	-	-	-	-	-	-	0.03	10.7	B	3
Oak Street at Major Site Driveway												
Oak Street NB Left/Thru	-	-	-	-	-	-	-	-	0.35	9.6	A	40
Commercial Site Driveway EB Left	-	-	-	-	-	-	-	-	1.38	> 120	F	278
Commercial Site Driveway EB Right	-	-	-	-	-	-	-	-	0.68	18.5	C	135

The intersection capacity analyses indicate that:

- Several intersections already experience LOS E to F in the Existing scenario.
- The intersection of Route 9 at Harrington Avenue/Svenson Road would experience significantly increased delays (>30 seconds) between the Existing and No-Build scenarios.
- With the addition of Project-generated traffic in the Build scenario, the Route 9 intersections from Harrington Avenue through to Oak Street and the intersection of Main Street at Route 140 will have significant changes (>30 seconds) in overall LOS from those in the No-Build scenario during at least some of the peak hour periods.
- Several unsignalized approaches will experience at least 15 seconds of additional delay between either the Existing and No-Build or the No-Build and Build scenarios.
- The level of service at many of the unsignalized intersections along Oak Street away from the site show little to no substantive changes from No-Build to Build conditions.
- Traffic exiting the site will experience moderate to long delays at the site drives.

Mitigation is proposed for several of the intersections to limit the impact of the Project on the surrounding roadway network, in the form of signal timings and/or geometric changes. Further details on intersection LOS and mitigation can be found in Section 7.3 and Appendix D – Traffic Impact and Access Study. Levels of service at the mitigated study intersections are depicted by color coding in Figure 25 through Figure 27 for the weekday morning, weekday afternoon, and Saturday midday peak hours, respectively.

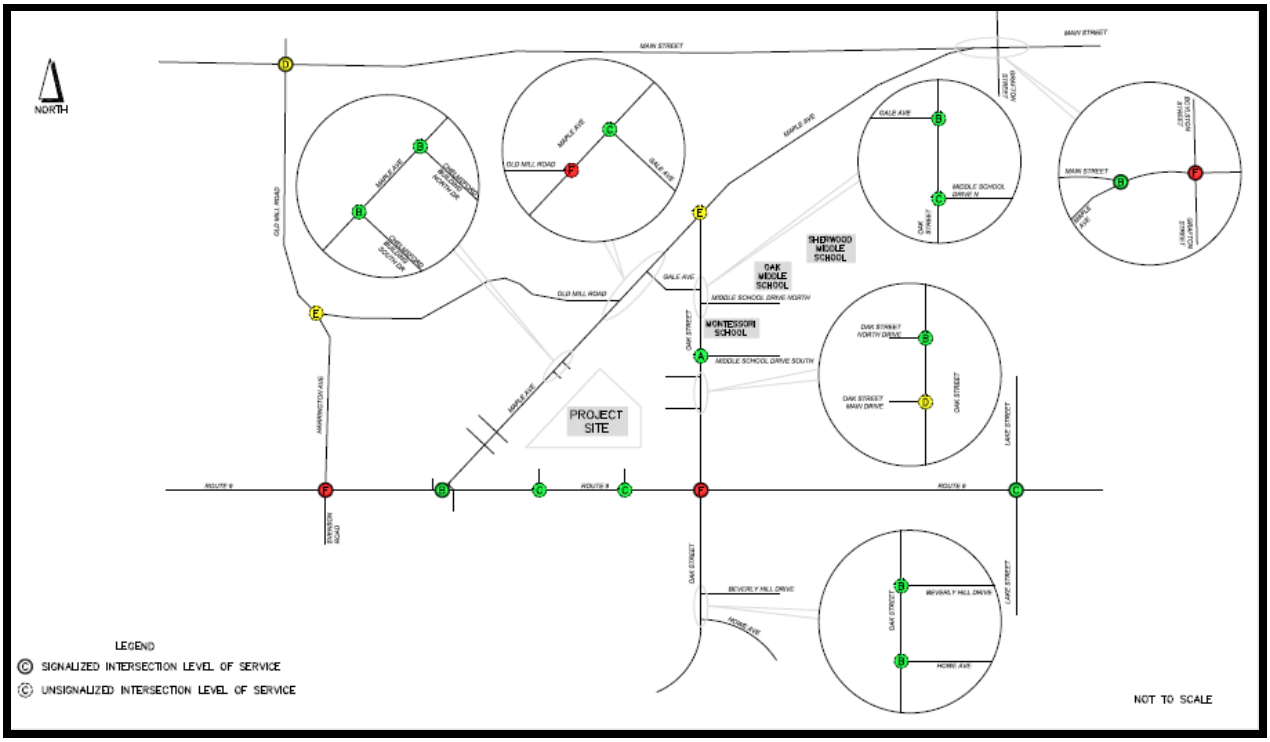


Figure 25. Full Build Level of Service With Mitigation AM Peak Hour*

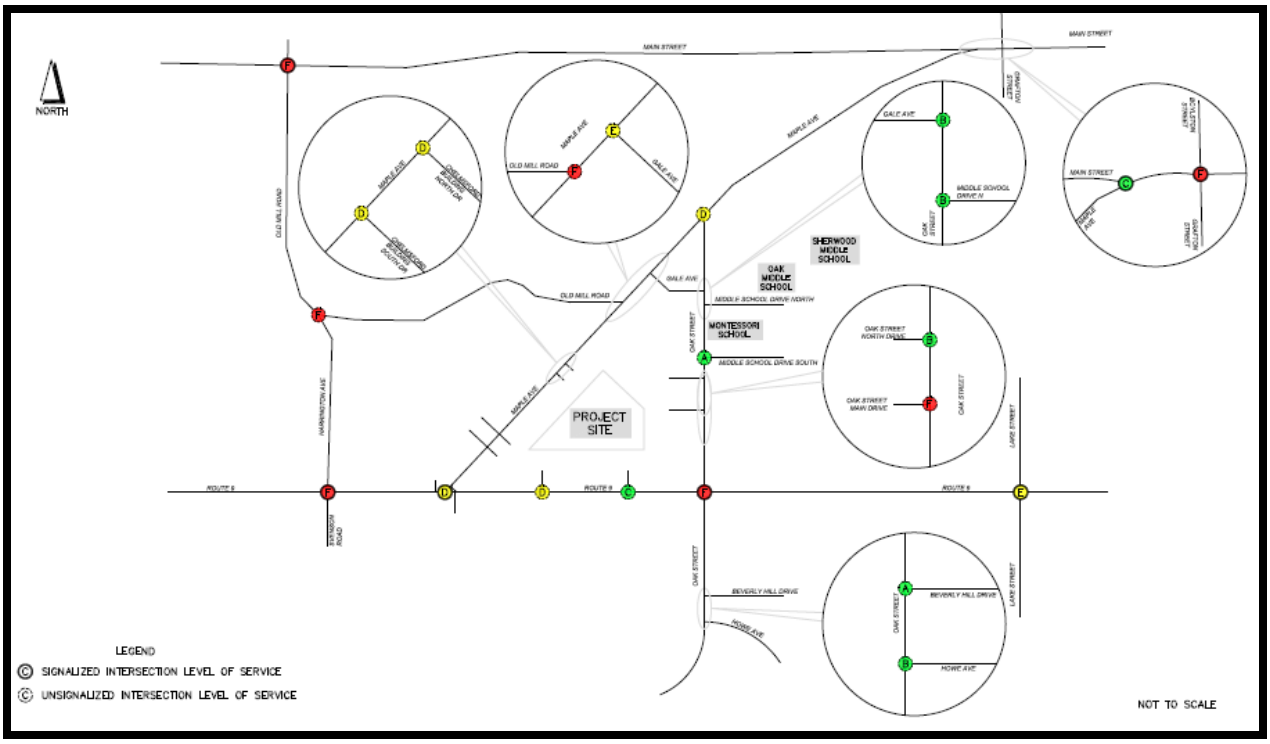


Figure 26. Full Build Level of Service With Mitigation PM Peak Hour*

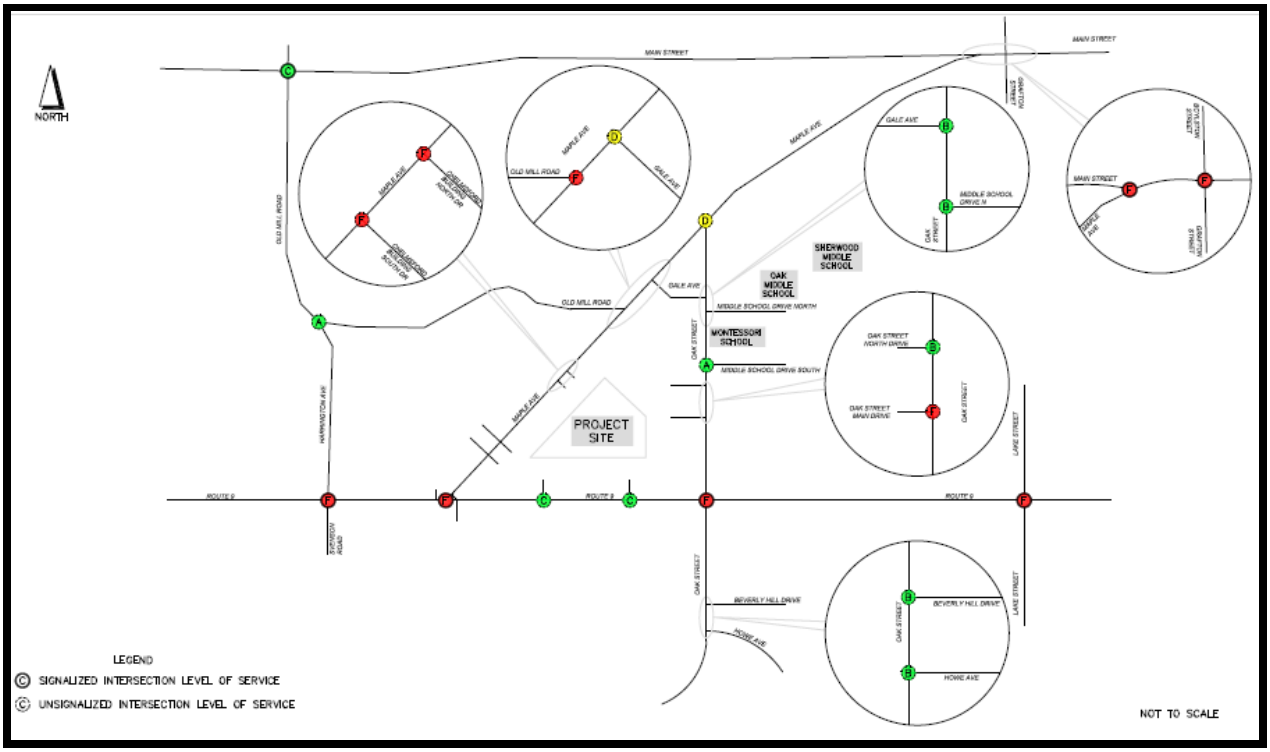


Figure 27. Full Build Level of Service With Mitigation Saturday Peak Hour*

7.2.3 Traffic Signal Warrant Analysis

The proposed mitigation does not include the addition of any new traffic signals to the roadway network as part of this Project. As a result, traffic signal warrant analyses were not needed.

7.2.4 Transit, Pedestrian, and Bicycle Access

Accommodations should be made to encourage patrons and employees to access the site by means other than private automobiles. Appropriate pedestrian amenities such as sidewalks and crosswalks will be expanded and constructed to provide access to the site. It is expected that bicyclists will access the site via Maple Avenue and Oak Street to and from Shrewsbury Town Center.

Currently, there is a bus stop serving the Worcester Regional Transit Authority (WRTA) bus Route 15 on Maple Avenue about 500 feet south of the Project site. As part of the construction, it is recommended that the stops be shifted north towards the site drive and a shelter be provided for the bus stop along the northbound side of Maple Avenue. Figure 28 depicts the proposed transit, pedestrian and bicycle access measures proposed for the Project.

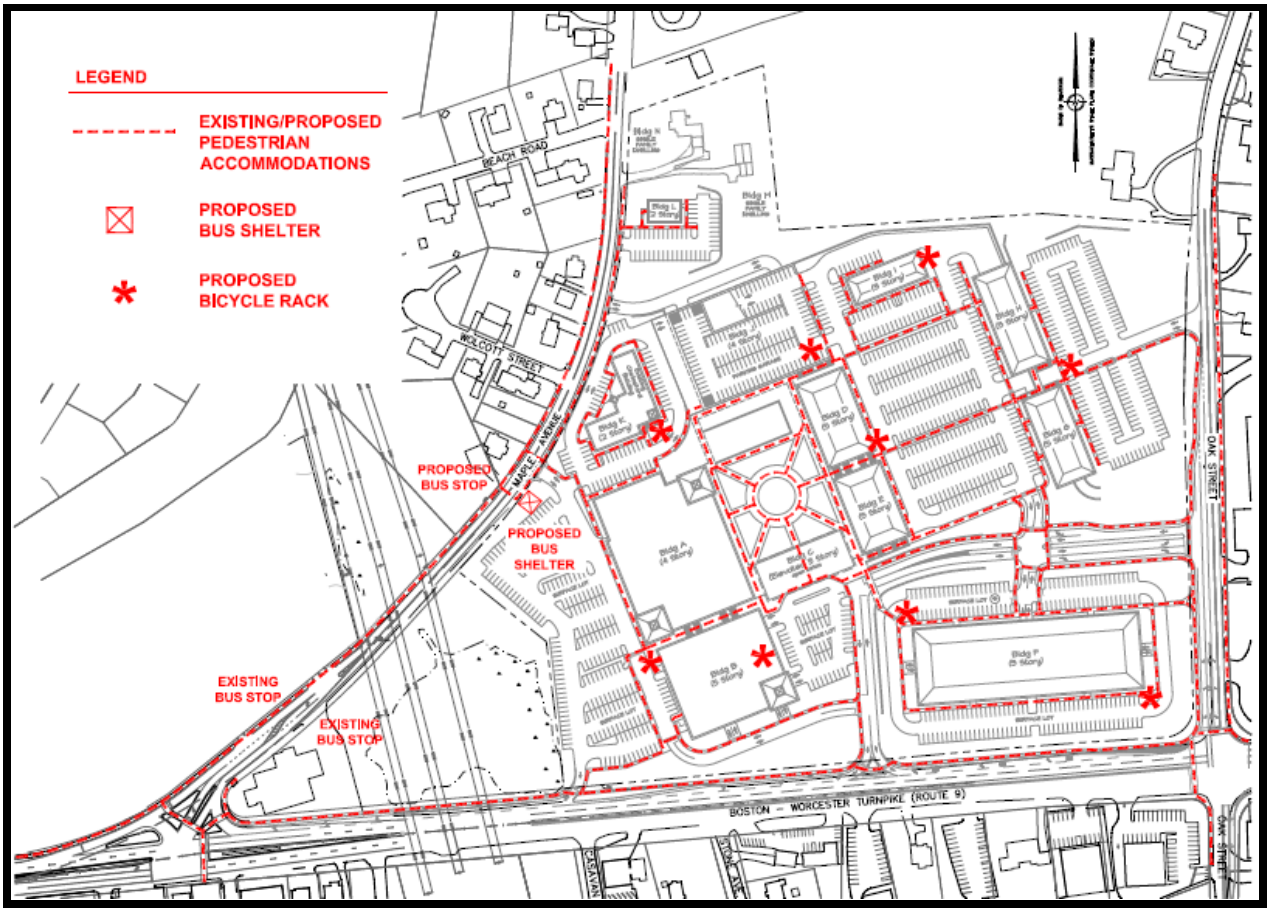


Figure 28. Proposed Transit, Pedestrian, and Bicycle Access

7.2.5 On-Site Circulation

The Project site is somewhat challenging in terms of topography and connection with Route 9, Oak Street, and Maple Avenue. Internally, vehicular connections between the lower level (i.e. the west side of site) and the upper level are limited to use of access of multi-story parking garages due to the steep grade difference. Central access for all levels of the site is proposed to be provided from Route 9, with a drive connecting to all site levels.

In addition to providing safe and efficient pedestrian access to the site from each of the surrounding roadways, internal connections are proposed for pedestrians. The on-site sidewalks are proposed to be connected by pedestrian walkways and by crosswalks traversing the drives and parking lots. Stairs and elevated pedestrian walkways are proposed to provide access between the different levels of the site.

To encourage bicycling as a viable option for accessing the proposed site, several recommendations have been made to ensure that employee and patron bicyclists receive accommodations on-site. Bicyclists are expected to use Maple Avenue and Oak Street to access the site from Shrewsbury Town Center. Bicycle parking for employees and visitors is proposed

throughout the site. Figure 6 shows the vehicle, pedestrian, and bicycle routes and amenities proposed on-site.

7.3 MITIGATION AND ACCESS PERMIT STANDARDS

Mitigation is proposed at some of the study intersections to minimize the impact of the Project on the surrounding roadways. Signal timing changes are proposed at the intersections of Route 9 at Harrington Avenue/Svenson Street, Route 9 at Lake Street, Main Street at Maple Avenue, and Main Street at Route 140. Geometric improvements are recommended at the intersections of Route 9 at Maple Avenue, Route 9 at Oak Street, and Maple Avenue at Old Mill Road. The Project Proponent will work with the Town of Shrewsbury to enhance safety and traffic operations through improved pavement markings and signage at the intersection of Old Mill Road and Harrington Avenue.

At Route 9 at Maple Avenue, it is proposed that existing raised splitter islands be reconfigured to accommodate two southbound left-turn lanes on Maple Avenue. However, the feasibility of providing a double-left movement needs to be explored further with respect to constructability, and potential right-of-way impacts. No easements or land taking are required for widening Oak Street at its intersection with Route 9, or for reconfiguring the splitter island and edge of roadway on Old Mill Road at Maple Avenue to provide a slightly wider approach.

These proposals are illustrated conceptually on Figure 29 through Figure 31. Larger scale plans of the proposals at each intersection are included in Appendix A, and full details of the proposed improvements can be found in Appendix D – Traffic Impact and Access Study.

Figure 29. Conceptual Mitigation Plan Maple Avenue at Route 9*

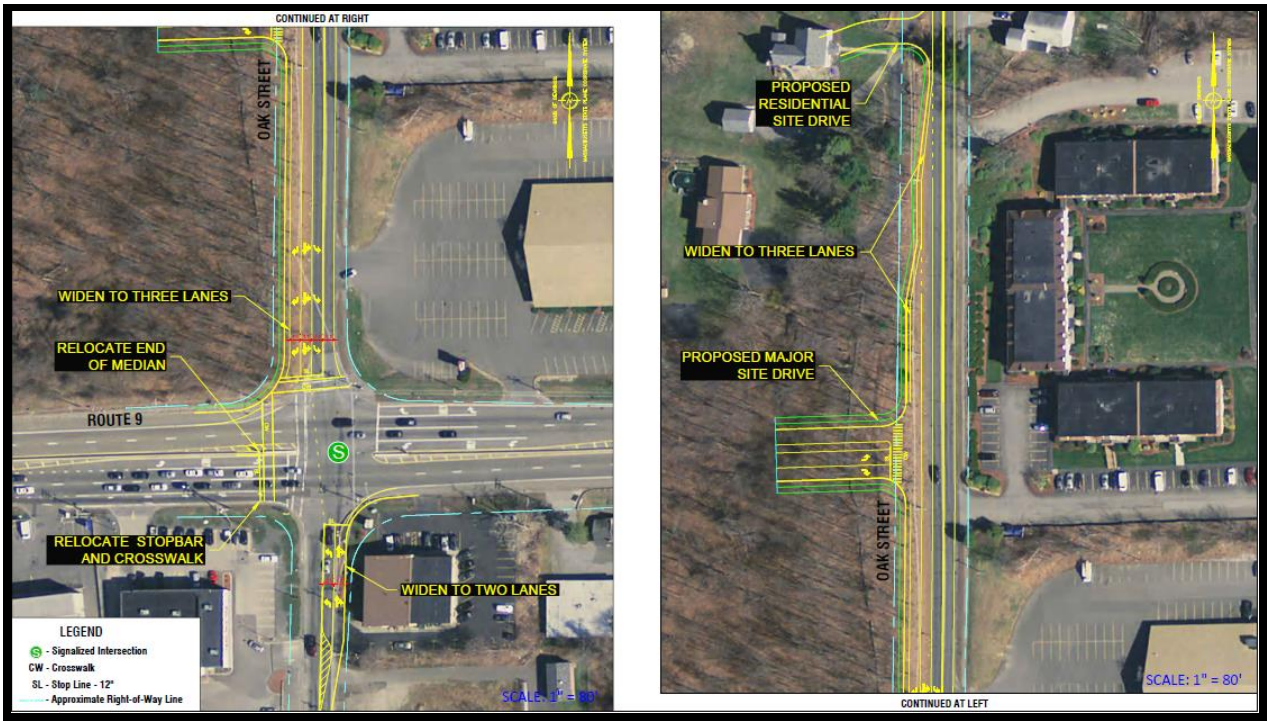


Figure 30. Conceptual Mitigation Plan Oak Street at Route 9*

Figure 31. Conceptual Mitigation Plan Maple Avenue at Old Mill Road*

As described in Section 7.2.5, bicycle parking for employees and patrons of the site is proposed to be provided. Tenants will be encouraged to provide services and amenities, such as shower and locker room facilities, for employees who bicycle to work.

To encourage public transit use, the Project Proponent will work with the tenants and encourage them to provide subsidies to their employees for transit fares, as well as encourage the tenants to schedule shifts to coordinate with the bus schedule. Carpooling or vanpooling is suggested. Providing preferential parking for employees that use carpools and vanpools would encourage shared travel. Support for ride-matching/carpooling could be achieved by actively promoting NuRide, the Commonwealth's web-based trip planning and ride-matching system.

Providing on-site amenities for employees would also reduce the number of external trips that would otherwise be made. The proposed food court in the center of the site would let employees get meals without having to leave the site. Trips to off-site banks would be reduced by encouraging tenants to provide direct deposit for employees, as well as encouraging ATM's and/or retail bank locations to be located on-site.

To limit peak hour traffic and to limit potential conflicts during peak hour traffic, tenants should be encouraged to schedule truck deliveries during off-peak hours.

8.0 GREENHOUSE GAS EMISSIONS

A revised greenhouse gas (GHG) emissions analysis was performed for the Grove, consistent with the EOEEA "Greenhouse Gas Emissions Policy and Protocol." A teleconference was held with MEPA and DOER on February 19, 2015, to discuss the GHG study, and agreement was reached with the agencies on the analytical approach. Specific items the Proponent agreed to are as follows: use of the 9th Edition of the Building Code (IECC 2012) as the Base Case; use of the EIA natural gas emission factor of 117.1 lb CO_2 per million Btu; the single-family homes will be constructed consistent with Energy-STAR Certified Homes version-3.1 in Massachusetts; and inclusion of a mesoscale air quality analysis.

Despite the fact Shrewsbury is not a Stretch Code community, many of the energy efficiency measures (EEMs) adopted by the Grove are equal to or better than the Stretch Code. In particular, the Project has adopted commercial building EEMs better than Stretch Code for roof and wall insulation, window glass heat transfer coefficient (U-value), and cooling unit energy efficiency ratio (EER). Details regarding the GHG analysis are provided in the full study, found in Appendix F – Greenhouse Gas Report.

8.1 BUILDING ENERGY AND GHG EMISSIONS ANALYSIS

The GHG Policy requires a Project to quantify carbon dioxide (CO_2) emissions and identify measures to avoid, minimize, or mitigate such emissions, quantifying the effect of proposed mitigation in terms of energy savings and emissions reduction. The GHG Emissions Policy and Protocol requires quantification of GHG emissions from three sources: direct emissions from on-site stationary sources, indirect emissions from energy generated off-site (electricity), and traffic generated by the Project. The Project's GHG emissions will include: 1) direct emissions of CO_2 from natural gas combustion for space heating and hot water; 2) indirect emissions of CO_2 from electricity generated off-site and used on-site for lighting, building cooling and ventilation, and the operation of other equipment; and 3) transportation emissions of CO_2 from Project traffic.

CO_2 emissions were quantified for: (1) the Base Case corresponding to the 9th Edition of the Massachusetts Building Code that includes the 2012 IECC (the "Code")[3], and (2) the Mitigation Alternative, which includes all energy saving measures, summarized in Section 8.4. Shrewsbury is not a Stretch Code community. This analysis uses the eQUEST energy design software (version 3.65), which incorporates the U.S. Department of Energy's DOE-2 building energy use model, and CO_2 emission rates of 117.1 lb/MMBtu of natural gas[4] and 730 lb/MWhr[5]. The EQUEST model takes account of building orientation with regard to solar exposure. The eQUEST model inputs and outputs are presented in Appendix F – Greenhouse Gas Report.

In some cases, the Project will build spaces equipped with full heating, ventilation, and air conditioning (HVAC) systems and lighting; in other cases, the Project will construct core and shell space in which tenants will fit-out the mechanical systems and lighting according to their needs.

[3] The one exception is the historical Chelmsford building on the site, which will be rehabilitated and reused for retail space. Per agreement with MEPA, the Base Case for this structure (Building K in the analysis) represents the existing structure with minimal insulation and single pane glass.

[4] U.S. Department of Energy, Energy Information Administration.

[5] ISO New England Inc., 2013 New England Electric Generator Air Emissions Report, Annual Average Emission Rate, Table 5.1, December 30, 2014.

The Project will assist building tenants in selecting energy efficiency measures and a draft outline for the Tenant Manual is provided in the GHG Report in Appendix F – Greenhouse Gas Report.

Table 10 summarizes total CO_2 emissions for the Project, for the Base Case (buildings that comply with the Code), and the Mitigation Alternative (includes all energy saving measures). The Project's buildings have not progressed past an early conceptual level of design. For this reason, the Proponent commits to the stationary source CO_2 reduction presented in Table 10, but retains the flexibility to achieve this goal using energy efficiency measures that may be refined at the stage of detailed design. Table 10 reveals that the Mitigation Alternative will reduce CO_2 emissions by 17.6%, compared to the Base Case. As discussed in Section 8.2, TDM measures for this Project will reduce Project-related motor vehicle CO_2 emissions by 2.0%. The net reduction of the Project's total CO_2 emissions (stationary sources plus transportation) is 10.6% compared to the Base Case. Overall Project energy use (by stationary sources) will be reduced 16.3%, as detailed in Table 4N of Appendix F – Greenhouse Gas Report, and this exceeds the Secretary's request for energy efficiency in the range of 12-15% better than Code.

Table 10. Summary of Greenhouse Gas Emissions

Source	Base Case (tons/year)	Mitigation Alternative (tons/year)	Change in CO_2 Emissions
Direct Emissions	915.0	530.2	-37.7%
Indirect Emissions	4,724.1	4,119.0	-8.5%
Subtotal Direct and Indirect Emissions	5,639.1	4,649.2	-17.6%
Transportation Emissions	4,549.0	4,458.0	-2.0%
Total CO_2 Emissions	10,188.1	9,107.2	-10.6%

At the completion of construction, the Proponent will provide a certification to the MEPA Office, signed by an appropriate professional, identifying either: 1) all of the energy efficiency mitigation measures adopted by the Project as part of the Mitigation Alternative have been implemented; or 2) an equivalent set of energy efficiency mitigation measures that together are designed to achieve the same percentage reduction in CO_2 emissions as the Mitigation Alternative, based on the same modeling assumptions in this report, have been adopted.

8.2 TRANSPORTATION GHG EMISSIONS ANALYSIS

The transportation portion of the GHG analysis calculated emissions of CO_2 for the traffic study area for three traffic analysis scenarios: 2022 No-Build; 2022 Build without TDMs; and 2022 Build with TDMs. For the area identical to that used in the EENF mesoscale GHG calculations, the vehicle miles traveled (VMT) were calculated by multiplying the length of each road segment by the average daily traffic (ADT) volume on the segment. The CO_2 emissions for each roadway segment were calculated by multiplying the daily VMT by the CO_2 emission factors of 550.40 grams per mile, which MEPA has approved. Average daily traffic volumes were provid-

ed by Green International Affiliates, Inc. Transportation CO_2 emissions are included in Table 10. The 2022 Build with TDMs CO_2 emissions are estimated to be 2% less[6] than those for the 2022 Build case.

8.3 MESOSCALE AIR QUALITY ANALYSIS

A mesoscale air quality analysis was performed for the Grove, consistent with the Massachusetts Department of Environmental Protection (DEP) guideline for mesoscale analyses[7]. Mesoscale emissions of volatile organic compounds (VOC) and oxides of nitrogen (NOx) were calculated for the same study area used for the CO_2 mobile source emissions analysis, and for four scenarios: 2014 Existing, 2022 No-Build, 2022 Build, and 2022 Build with Mitigation. This analysis used the US Environmental Protection Agency (EPA) MOBILE 6.2 Mobile Source Emission Factor Model.

The results show that the emissions of VOC and NOx in the Project study area for the 2022 Build case will be larger than the emissions for the 2022 No-Build case. Details are provided in Section 2.3 of Appendix F – Greenhouse Gas Report. The Project will mitigate potential air quality impacts by committing to a number of TDM strategies, discussed in Section 8.4.3. The TDM measures will improve traffic operations, reduce Project-generated vehicle trips, and reduce Project-related motor vehicle air pollutant emissions. These mitigation measures will result in small reductions in VOC and NOx emissions compared to the 2022 Build case. The proposed TDM measures and roadway/traffic signal improvements constitute all reasonable and feasible traffic mitigation measures for the Project.

The Commonwealth's State Implementation Plan (SIP) for achieving compliance with the eight-hour ozone standard includes allowances for increases in VOC and NOx emissions due to general background growth, and the Project's VOC and NOx emissions are part of the Commonwealth's background growth allowance. The mesoscale air quality analysis demonstrates that the Project will not have an adverse impact on regional air quality and is consistent with the Commonwealth's SIP to achieve the eight-hour NAAQS for ozone.

8.4 MITIGATION

The Grove Proponent will adopt EEMs and other forms of mitigation in siting and site design, building design and operations, and transportation.

8.4.1 Siting and Site Design Mitigation Measures

The Project will adopt all reasonable and feasible site design mitigation measures. The Project is committed to the following mitigation measures:

- ***Sustainable Development Principles*** – The Project conserves land by reusing a previously developed commercial site.

[6] Ewing, R. "TDM , Growth Management, and the Other Four Out of Five Trips," Transportation Quarterly, Vol. 47, No. 3, 1993, pp. 343-366.
[7] MassDEP, Guidelines for Performing Mesoscale Analysis of Indirect Sources, May 1991.

- ***Design Project to Support Alternative Transportation to the Site*** – The Worcester Regional Transit Authority Bus Route 15 stops at Fairlawn Plaza, which is across Maple Avenue from the Project site. This WRTA bus provides transit service to Union Station in downtown Worcester. The Proponent will be providing a new bus shelter near the Project site, as can be seen on Figure 28.

- ***Design Water Efficient Landscaping*** – Water efficient landscaping will be installed to minimize water use. Drought-resistant and native plants will be used for landscaping.

- ***Minimize Energy Use Through Building Orientation*** – The retail and office buildings along Route 9 (Buildings B and F) will have sides facing south.

- ***Best Practices for Stormwater Design*** – To the extent possible, the stormwater management system will utilize Best Management Practices (BMPs).

8.4.2 Building Design and Operation Mitigation Measures

The Project will adopt all reasonable and feasible building design mitigation measures. The Project is committed to the following measures, details for which are found in Appendix F – Greenhouse Gas Report:

- ***Energy Efficient Windows and Building Envelope*** – Commercial building envelope insulation will exceed Code for roof insulation, wall insulation, and window glass heat transfer coefficient. For retail and office buildings, window glass area as a percentage of wall area will be reduced.

- ***Demand Control Ventilation (DCV)*** – DCV controls for Outside Fresh Air will be used in all commercial buildings, where possible.

- ***Higher-Efficiency HVAC Heating Systems*** – Commercial building heating systems will be more efficient than Code.

- ***Seal, Test, and Insulate HVAC Supply Ducts*** – HVAC supply ducts will be sealed, leak tested, and insulated to reduce energy losses.

- ***Cool Roofs*** – Commercial buildings will have light-colored membrane roofs.

- ***Energy Management Systems*** –The buildings will utilize highly efficient energy management systems (EMS) to track and control energy use. Energy needs will be closely monitored and the use of heat, cooling, and lighting will be minimized.

- ***Energy Efficient Interior Lighting*** – Through a Tenant Manual, the Proponent will encourage tenants to design interior lighting with a Light Power Density (LPD) below Code.

- ***Energy Efficient Exterior Lighting*** – Energy efficient LED fixtures will be used to light the parking garages and surface parking areas.

- ***Occupancy Controls for Lighting*** – The Proponent will recommend occupancy controls to tenants for restrooms, offices, and unoccupied storage rooms.

- ***Use Water Conserving Fixtures and Practices*** – Restrooms in commercial buildings will use low-flow faucets in wash sinks and low-flow toilets and urinals. In conjunction with water-efficient landscaping, the Mitigation Case targets a 15% reduction in water use for the Project compared to the Base Case.

- ***Energy STAR Appliances*** – Energy STAR appliances will be used in residential units and associated laundry rooms to reduce plug load. The Proponent will encourage Energy STAR computers and break-room refrigerators for the office space.

- ***Energy STAR Hot Water Heaters*** – Energy STAR rated hot water heaters will be used in the multi-family residential buildings.

- ***Recycle Materials*** – The Proponent will encourage tenants to collect and recycle cans, bottles, and office paper.

- ***Use Building Materials with Recycled Content, Building Materials that are Manufactured within the Region, Use Rapidly Renewable Building Materials, and Use Low-VOC Building Materials*** – Whenever practical, the Project will use environmentally friendly building materials, including materials with recycled content, rapidly renewable building materials, and low-VOC materials. Also when practical, the Project will purchase building materials that are manufactured within the region.

8.4.3 Transportation Mitigation Measures

The Grove is well located in relation to the regional roadway network and WRTA Bus Route 15 that stops near the Project site. The Proponent is committed to a program of Transportation Demand Management (TDM) strategies to reduce employee and customer vehicle trips, listed below:

- ***Locate New Buildings Near Transit*** – The Worcester Regional Transit Authority Bus Route 15 stops at Fairlawn Plaza, which is across Maple Avenue from the Project site. This WRTA bus provides transit service to Union Station in downtown Worcester. The Proponent will be providing a new bus shelter near the Project site.

- ***Electric Vehicle Charging Stations*** – The Project will provide one or more electric vehicle charging stations.

- ***Nearby Food Service*** – The Project includes a food court and, depending on leasing interest, may have other on-site food services. In addition, two restaurants (Subway and Imperial Buffet) are within easy walking distance on Maple Avenue.

- ***Sidewalk Connections to Other Commercial Developments*** – Existing and proposed sidewalks connect the Project site to other commercial developments on the north side of Route 9, including restaurants on Maple Avenue.

- ***Develop a Parking Management Program to Minimize Parking Demands*** – The mixed-use nature of the Project will inherently reduce the overall parking demand. The peak parking demand for each use is expected to occur at different times throughout the day. As a result, the parking facilities provided on-site will be shared among many uses. The internal layout of the proposed buildings and parking areas are designed such that multiple land uses will be easily accessible from the surface parking lots and parking structures.

- ***Provide Bicycle Storage*** – Secure, weather-protected bicycle racks will be provided at locations within the site with signs directing bicyclists to the bike storage facilities.

- ***Tenant Manual for Employee Services*** - The Proponent will be leasing all office and retail space and thus there are a number of TDMs that can only be implemented by the tenant-employers. The Proponent will prepare a Tenant Manual that will encourage tenant-employers to offer their employees: 1) direct deposit of paychecks; 2) alternative work schedules to reduce peak hour traffic volumes; 3) transit pass subsidies; and 4) a guaranteed ride home program for employees who van/carpool.

- ***Preferential Parking -*** Preferential parking for employees that use carpools or vanpools.

9.0 MITIGATION SUMMARY

Each topical Chapter of the DEIR contains detailed discussions of and proposals for mitigation. In addition, Appendix G – Draft Construction Management Plan contains construction control commitments. These are summarized here for convenience.

9.1 CONSTRUCTION CONTROL

Construction controls, described in detail in Appendix G, are planned to begin with:

- Start Work Notice to the Shrewsbury Building Department, Engineering Department, and Conservation Commission and
- Pre-Construction Meeting including representatives from the Town of Shrewsbury Building Department, Engineering Department, Conservation Commission, the Architect, the Engineer, and the Project Proponent.

During the course of construction, the following general controls will be employed:

- Construction hours will be limited to Monday through Friday 7:00 am to 5:00 pm, Saturday 8:00 am to 5:00 pm;
- Construction fence will be installed around the perimeter of the site;
- Access to the site will be via construction entrances located off Route 9 and secondary entrance located off Maple Avenue;
- Parking areas for construction employees will be established on site as soon as practicable after building demolition activities have been completed;
- At the end of each work day, the access gates shall be closed and secured with a chain and lock;
- To the extent practicable, trench excavations shall be backfilled and compacted at the end of each work day;
- For excavations that cannot be backfilled, the contractor shall stabilize side slopes and provide temporary barricades around the perimeter of excavation;
- Construction staging areas will be located to isolate construction activities from public ways to provide safe access for pedestrians, automobiles, and emergency vehicles around the project site; and
- Route 9, Oak Street, Maple Avenue will remain open to traffic except for short periods of time necessary for safe delivery of large materials.

Special care will be taken with environmental remediation and asbestos abatement, as follows:

- The site will be inspected by a Licensed Site Professional (LSP) for evidence of asbestos containing materials and/or other types of hazardous building materials including but not limited to fuels, solvents, storage tanks, florescent light bulbs, etc.;
- If hazardous materials are encountered on-site, they will be removed and disposed of by a licensed contractor under the direction of a LSP; and
- The LSP will prepare a written report which documents the hazardous materials encountered on site and their disposal.

Several steps will be taken for air quality control, including:

- Wet suppression to minimize the generation of dust from demolition activities, excavation operations and on-site vehicle traffic;
- Use of calcium chloride to control dust, if needed;
- Covering loads on construction vehicles hauling materials to and from the site;
- Covering tops of stockpiles and/or seeding with erosion control mix;
- Ensuring disturbed areas are minimized and disturbed areas are stabilized as soon as earthwork activities are completed;
- Installing crushed stone tracking pads at the site construction entrances;
- Sweeping streets to remove any sediment tracked onto public ways; and
- Encouraging contractors to comply with MassDEP's "Diesel Engine Retrofits in the Construction Industry: A How to Guide" and the use of ultra-low sulfur diesel in off-road engines.

Noise control also will be provided during construction. The following noise mitigation measures will be implemented at the site and will remain in effect for the duration of construction:

- All exhaust mufflers on construction equipment will be in good working order;
- Contracts will include language requiring contractors to properly maintain their equipment;
- Back-up alarms on vehicles and equipment will be adjusted as low as possible to reduce noise, without compromising safety;
- When feasible, equipment that is not being used will be turned off;
- Noise creating equipment on-site will be located as far as possible from sensitive receptors;
- Engine housing panels on all equipment will be kept closed;
- Electricity will be obtained from the electric grid as soon as feasible to reduce the use of portable generators; and
- No construction vehicle and/or equipment shall commence warming-up prior to the permitted hours of construction.

Erosion and sediment control will include:

- Adherence to a Stormwater Pollution Prevention Plan (SWPPP) prepared in accordance with the NPDES permit requirements and the 2012 NPDES Massachusetts Construction General Permit;
- Design, installation, and maintenance of soil erosion and sediment control best management practices (BMPs) implemented during construction shall meet the performance standards outlined in the Massachusetts Stormwater Management Guidelines; and
- In addition to installing and maintaining the erosion control BMPs, the Contractor will be required to implement and maintain the following erosion control measures:
    - Prior to the commencement of construction, install straw wattles around the perimeter of the proposed work area;
    - Provide straw wattles around the perimeters of stormwater inlets and install filter bags beneath the grates of all new catch basins installed;
    - Construct silt fence barrier around the perimeter of soil stockpiles;

- Stabilize erosion-prone areas left exposed for extended periods of time with mulch or seed for temporary vegetative cover;
- Do not leave areas subject to erosion un-stabilized for periods longer than is necessary to carry out that portion of the work;
- Stabilize all slopes steeper than 3:1 with an erosion control blanket or jute mesh upon the completion of loaming and seeding activities;
- Grade, mulch, or re-vegetate all exposed areas with appropriate groundcover at the completion of all site work activities;
- Retain extra straw wattles, silt fence, and filter bags on-site during construction to replace those damaged or deteriorated;
- Retain and maintain the wattle barrier along the perimeter of the project until ground cover is established;
- Inspected all sediment and erosion control measures at regular intervals (and after each rainfall event of 0.25 inches or more) and repair as required; and
- Pump and clean all on-site catch basins and stormwater treatment units of sand and sediment upon completion of construction.

Construction dewatering likely will be required at the Grove. The following controls will be employed:

- The removal of water from the excavated area may be accomplished by gravity drains, daylight channels, mechanical pumping, and siphoning;
- Settling or filtering sediment will be provided for all dewatering;
- Discharge areas will be chosen with careful consideration to the down-gradient resource areas and the land's ability to treat water flows from the dewatering process;
- Discharge will be stopped immediately if the receiving area is showing any sign of instability or erosion;
- If the collected runoff is contaminated with oil, grease, or other petroleum products, and oil/water separator or a filtration mechanism will be used; and
- If the water has been contaminated by toxic and hazardous materials it will be contained and hauled by a licensed transporter for disposal.

Construction period solid waste and recycling mitigation will comprise:

- Notification to the MassDEP 10 working days before construction or demolition of a building (BWP-AQ-06);
- To the extent feasible, demolition materials will be segregated on-site for reuse or disposal;
- Construction materials that can be recycled (brick, concrete, gypsum wallboard, wood, metal, and asphalt roofing) will be separated and taken to a recycling facility or mixed materials will be delivered directly to a C&D processor;
- Any materials that cannot be recycled will be placed in dumpsters and transported from the site and disposed of at an approved solid waste disposal facility; and
- To the extent practicable, the contractor will seek product manufacturers that offer a take back and/or recycling program.

9.2 HISTORIC RESOURCES

The Proponent will restore and reuse the historic core of the Chelmsford Building, as follows:

- The warehouse additions are of no architectural or historical significance and will be demolished.
- Art Deco stone, brick, and stucco of the original building will be cleaned and restored to original condition as closely as possible, considering the current condition and availability of matching building materials.
- Where new materials must be added, such as for new or modified existing walls and to update doors and windows for new uses and energy efficiency, the original style of the building will be respected in the choice and finish of materials.
- The Project will rejuvenate the façade along Maple Avenue and accessorize the building with a new, widened stair and an accessible entries, new balconies for restaurant or retail use, new canopies to cover the balconies and exterior pedestrian paths, and a new building core of restrooms and services.

9.3 LAND ALTERATION

Impacts associated with land alteration will be mitigated by implementing the following measures:

- Creation of approximately 8.4 acres (27%) of open space;
- Take advantage of the site's topographic relief by terracing the uses vertically.
- Provide multi-level structured parking;
- Shared parking facilities resulting in a 23% reduction in the overall parking provided, as compared to that required under zoning;
- Reduced parking stall dimensions;
- Incorporate 25% compact spaces; and
- Designate employee parking areas.

9.4 WETLANDS

The proposed alterations to the wetland resource areas or their buffer zones will be subject to a filing of a Notice of Intent (NOI) with the Shrewsbury Conservation Commission. Mitigation will include wetland replication to compensate for the loss of BVW at a minimum ratio of 1:1—a replacement ratio of about 2.6:1 is proposed. Replication areas will be designed and constructed in accordance with the requirements of the Shrewsbury Conservation Commission and the Wetlands Protection Act Regulations, 310 CMR 10.0.

9.5 STORMWATER MANAGEMENT

The Project has been designed so that post-construction runoff will be equal to or less than existing run-off, as follows:

- All stormwater runoff from the parking areas and driveways will be collected in deep-sump, hooded catch basins, conveyed to stormwater treatment units, and then to various subsurface infiltration systems and subsurface detention systems located throughout the site.

- Controlled outflow from the infiltration systems will be discharged to upland areas on-site at a rate equal to or less than existing conditions for the 2, 10, 25, and 100-year, 24-hour design storms.
- Rooftop runoff from the proposed buildings will be directed to subsurface infiltration facilities to infiltrate the required volume to meet the requirements of the Massachusetts Department of Environmental Protection (MassDEP) Stormwater Management Standards.
- Although the Project is, in part, a redevelopment project, it has been designed to comply with all requirements for a new project.

9.6 WATER SUPPLY AND SEWAGE

The Proponent is proposing several mitigation measures for the Project with regards to water use and wastewater generation.

- The Proponent will pay a connection fee of $0.50 per square foot on the area of the lot within 100 feet of a street line to the Town of Shrewsbury;
- The Proponent will remove 4 gallons of flow for each gallon added to the system at a cost of $3.00 per gallon;
- The Proponent will coordinate closely with the MassDOT and the Town of Shrewsbury in conjunction with final Project approvals to coordinate the upgrade of the 6" water main in Maple Avenue to a 12" main from approximately station 52+50 to approximately station 64+00, at the intersection of Maple Avenue and Beech Road.
- The Proponent will provide a new 12" loop connection from Maple Avenue through the Project site, to the existing 12" water main in Oak Street, along with easements for the benefit of the Town of Shrewsbury to own and maintain the 12" main on the Grove site.
- The Proponent will pay a connection fee of $4,000 per single family dwelling, $10,000 per 4-unit dwelling (plus $2,000 for each dwelling unit over 4 units), and $4,000 plus $1,000 for every 1,000 gallons per day (gpd) above 1,000 gpd, for non-residential uses; and
- The Proponent will pay a water conservation fee of $1,000 per residential connection and $1.00 per gpd for all new non-residential construction.
- The Proponent also has agreed to the following water conservation measures:
    - Limiting use of municipal water supply to only those activities requiring potable water;
    - Installation of flow restrictors for plumbing fixtures;
    - Installation of faucets with water conserving aerators;
    - Installation of low-flow or high efficiency toilets;
    - Use of water efficient household appliances wherever possible;
    - Efficient irrigation to reduce evaporative loss and to prevent overwatering;
    - Maximization of irrigation equipment:
        - Installation of water conservation equipment including moisture sensors, rain shut-off devices, and climate-based controllers; and
        - Proper operation and maintenance of automatic irrigation system
    - Developing and implementing a water savings strategy, addressing among other items:
        - demand management, leak detection, and repair,
        - a program of preventative maintenance, and
        - a program of employee education; and

- Developing and implementing seasonal demand management plans as part of a drought management plan.

9.7 TRANSPORTATION

Mitigation is proposed at several of the study intersections to minimize the impact of the Project on the surrounding roadways, as follows:

- Signal timing changes are proposed at the intersections of Route 9 at Harrington Avenue/Svenson Street, Route 9 at Lake Street, Main Street at Maple Avenue, and Main Street at Route 140;
- Geometric improvements are recommended at the intersections of Route 9 at Maple Avenue, Route 9 at Oak Street, and Maple Avenue at Old Mill Road;
- The Project Proponent will work with the Town of Shrewsbury to enhance safety and traffic operations through improved pavement markings and signage at the intersection of Old Mill Road and Harrington Avenue.
- An extensive suite of transportation demand management (TDM) techniques will be employed; and
- Traffic monitoring is proposed both to assure that needed improvements are made timely and that appropriate progress is made on TDM measures.

These improvements will be carried out in response to increases in traffic at the site, as outlined in the Section 61 Findings in Appendix D.

9.8 GREENHOUSE GAS EMISSIONS

The full list of energy building energy efficiency measures (EEMs) adopted by the Proponent is given below, with more details in Appendix F – Greenhouse Gas Report. Since the EENF and NPC, the following additional building energy efficiency measures have been adopted:

- Commercial building roof insulation has been increased;
- Light power density for office space and single family dwellings has been reduced;
- Multifamily residential space will have Energy STAR rated hot water system; and
- Parking garages and lots will use LED lighting.
- The Project will provide one or more electric vehicle charging stations.

For the commercial buildings, the HVAC cooling efficiency equals the IECC 2012 Code. The Proponent considered the possibility of committing to a higher energy efficiency ratio (EER), but found that even a 5% increase in EER above the 2012 Code would add $400,000 in capital costs to the Project and is financially infeasible. For commercial buildings, the light power density equals the IECC 2012 Code. The Proponent considered the possibility of committing to a 15% reduction in LPD as suggested in the comments, but found this to be financially infeasible. Other building design and operation mitigation measures were analyzed for the Project, but were rejected because they are either technically/financially infeasible or inappropriate for the Project:

- Reduce Energy Demand by Using Peak Shaving or Load Shifting Strategies;
- Incorporate Combined Heat and Power (CHP) Technologies into Project;
- Construct Green Roofs; and

- Commercial Building Solar Hot Water System.

An additional EEM that will be studied further at the stage of detailed design is:

- Residential Solar Hot Water Panels; and

The Proponent commits to having “solar-ready” space available on each commercial building for a possible future third-party PV installation.

As detailed in Appendix F – Greenhouse Gas Report, the Project design includes the following building design and operational energy efficiency measures (EEMs):

- Using higher efficiency windows and building envelopes (roof and wall insulation);
- Providing demand control ventilation (DCV) in commercial spaces, where possible;
- Specifying higher-efficiency heating systems;
- Sealing, insulating, and testing HVAC supply ducts;
- Employing light-colored membrane roofs (cool roofs) on commercial buildings;
- Installing energy management systems in commercial buildings;
- Using LED lighting for parking garages and exterior areas;
- Recommending occupancy lighting controls to tenants;
- Installing Energy STAR appliances in residential units;
- Installing Energy STAR hot water heaters in multi-family residential units;
- Encouraging commercial tenants to use Energy STAR computers and other equipment;
- Encouraging tenants to install cooling and interior lighting systems better than Code;
- Supporting tenant recycling efforts;
- Using environmentally friendly building materials; and
- Setting aside solar-ready roof space on a large commercial building for a possible third party Photovoltaic (PV) installation.

RESPONSE TO COMMENTS

The following table extracts the comments made by the Secretary, Agencies, Shrewsbury, and interested citizens and provides a brief response to each. The full text of each comment can be reviewed in Appendix H – Certificates and Comments.

Code	Comment	Response
SECRETARY'S CERTIFICATE ON THE EXPANDED ENF – FEBRUARY 14, 2014 (COMMENT 1) **SECRETARY'S CERTIFICATE ON THE NOTICE OF PROJECT CHANGE – AUGUST 8, 2014 (COMMENT 1A)**		
1-1	I encourage the Proponent to continue to explore ways to limit the amount of paved parking on-site by either banking parking areas until their construction is warranted by demand and/or using gravel or permeable pavement.	The Proponent will work closely with Shrewsbury Town Officials during the local approval process to reduce impervious coverage including the following measures: • Provide multi-level structured parking. • Provide shared parking facilities resulting in a 23% reduction in the overall parking provided, as compared to that required under zoning. • Reduced parking stall dimensions • Incorporate 25% compact spaces • Incorporate permeable paving materials where feasible.
1A-2A	Also, as requested by MassDOT, the Proponent should explore the feasibility of allowing/providing for a double left-turn movement from Maple Avenue southbound onto Route 9 eastbound. The Proponent should address this issue with MassDOT during the permitting process for Phase I.	The feasibility of providing a double left-turn from Maple Avenue onto Route 9 eastbound has been explored. It would require additional ROW from the Fairlawn Plaza site. A conceptual drawing is shown on Figure 29 in the Draft EIR.
1-2	The Proponent should provide safe, clear connections for pedestrians to [the Maple Avenue] sidewalk from the project site during all project phases.	Pedestrian connections to/from Maple Ave are planned, and are shown schematically in Figure 28 in the Draft EIR
1-3	The Proponent should actively work with the proposed tenants to develop this [Transportation Demand Management] program and memorialize the implementation of this program in lease agreements.	The Proponent will work with and coordinate with each tenant to encourage the successful implementation of the proposed TDM program.

Code	Comment	Response
1-4	The wetlands replication/mitigation should be consistent with the BVW performance standards in 310 CMR 10.55(4), and the design for the replication based upon the MassDEP Massachusetts Inland Wetland Replication Guidelines, March 2002.	A detailed wetland replication design including grading, construction details, and construction sequence will be developed in accordance with Massachusetts Inland Wetland Replication Guidelines dated March 2002 and all applicable performance standards in 310 CMR 10.55(4).
1-5	As part of the Notice of Intent (NOI) process with the Shrewsbury Conservation Commission, the Proponent should provide documentation to demonstrate that adequate groundwater conditions are present to sustain a replicated wetland.	The Proponent will work closely with the Shrewsbury Conservation Commission to ensure adequate base flow is provided to support the replication area. Base flow is anticipated from groundwater and through controlled discharge from treated stormwater.
1A-5A	I encourage the Proponent to revise and/or expand the Tenant Manual to include specific actions on the part of the Proponent to assist tenants in adopting energy efficiency measures.	The Proponent will identify the new 2012 IECC Code requirements for tenants and will encourage them to consider additional energy reducing measures listed in the Draft Outline for Tenant Manual.
1A-5B	Several elements of Phase 1 GHG analysis should be reevaluated prior to final selection of building systems and design completion to ensure the accuracy of the projected GHG emissions reductions and achieve those reductions. • The vast majority of reductions in gas usage in the Fitness Center/Office Building are derived from the use of low-flow showerheads in the Fitness Center. The Proponent should reevaluate this measure to ensure that savings for this energy reduction measure is not overstated, thereby masking opportunities for additional energy savings elsewhere in building design. • The Proponent should continue to assess the possible implementation of a SHW system for the commercial building to reduce gas usage for hot water heating or a PV system to offset electricity use. • The use of higher-efficiency rooftop cooling units for the commercial space (minimum 15 percent better than	The six listed elements from the NPC GHG analysis were calculated correctly: • The reason most of the reduction in gas use in the Fitness Center/Office Building is related to showers is because heating hot water sufficient to provide all the showers needed for a large fitness center uses much more natural gas than heating the space inside a building envelope that is tight and well-insulated, as required by Code. The eQUEST model output in fact shows that on a percentage basis, the reduction in gas use for space heating afforded by the proposed mitigation program (59%) is greater than the reduction in gas use for hot water heating to run showers (44%). Note that the Fitness Center has now been eliminated from the design. • The SHW system was re-analyzed using the latest capacity factor for such a system from the DOE Energy Information Administration and the results show the payback period exceeds the life of the equipment and a SHW system is economically infeasible. The re-

Code	Comment	Response
	Code) should be reevaluated. • Reduction of light power densities in the commercial space by at least 15 percent below the Code maximum. • Require the adoption of plug load reduction strategies (i.e., lighting, EnergyStar appliances, etc. during tenant fit-out in lease agreements). • Construct single family home and duplex consistent with sustainable and energy efficiency programs such as Leadership in Energy and Environmental Design (LEED) for Homes or EPA's Energy Star.	vised PV feasibility analysis uses the latest installed cost data from the EOEEA website. • The possibility of increasing HVAC EER values above those mandated by the IECC 2012 Code was considered by the Proponent. He states that a 5% increase in EER above the 2012 Code would add $400,000 to capital costs; a 15% increase in EER would be even more costly, and both are financially infeasible. The Project's electric utility does not have financial subsidies for commercial property owners to assist with the capital cost. • The light power density for Office use has been reduced from 1.0 W/sf in the original design to 0.9 W/sf, which equals the requirement of the Stretch Code, even though Shrewsbury is not a Stretch Code community. The possibility of reducing LPD further was considered by the Proponent; he states a further reduction of 15% to 0.76 W/sf is not financially feasible. • Residential units will be equipped with Energy STAR appliances. An attempt to mandate beyond-Code requirements to commercial tenants, or dictate what equipment could or could not be used, would damage the Proponent's ability to lease commercial space in the Project. The Tenant Manual encourages commercial tenants to use Energy STAR rated computers and other equipment. • The new single-family residences will be constructed in a manner generally consistent with LEED for Homes. The following design features of that home are consistent with the Program Requirements for Energy STAR Certified Homes, version 3.1 in Massachusetts: ➢ Cooling equipment. E-Star requires SEER 13. The Project air conditioning units will meet or exceed this standard. ➢ Roof/ceiling insulation. E-Star requires R49. The Project will build

Code	Comment	Response
		R49. ➢ Wall insulation. E-Star requires R20. The Project will build R20. ➢ Slab insulation. E-Star requires R10. The Project will build R10. ➢ Basement wall insulation next to conditioned space. E-Star requires R15 continuous. The Project will build R15 continuous. ➢ Household and kitchen appliances. E-Star requires Energy STAR certified appliances. The Project will install Energy STAR certified appliances.
1-6	In compliance with M.G.L. c.9, sections 26-27c (950 CMR 71.00), the Proponent should engage in the consultation process with MHC for this project.	The Proponent has initiated the consultation process with the MHC and achieved general agreement with the proposed rehabilitation and reuse proposal. Consultation will continue during the remainder of the MEPA review. Chapter 2.0 provides details on both the Chelmsford Building and the consultation process.
1-7	[T]he Proponent should provide elevation drawings of the proposed rehabilitation of the Chelmsford Ginger Ale Company building and the design of the proposed Phase 1 construction for consideration during the MHC consultation process.	Figure 9 shows the proposed elevation of the rehabilitated Chelmsford Building. All construction will take place as part of the Project build-out—no separate Phase I now is proposed on the main part of the site.
1-8	I strongly encourage the Proponent to incorporate a robust program of construction waste recycling and solid waste management given the proposed building and parking lot demolition associated with the project.	The Project will comply with all applicable Federal, State, and local requirements regarding the handling, recycling, and disposal of solid waste generated by the Project. To the extent feasible, demolition materials will be segregated on-site for reuse and disposal.
1-9	The Proponent should implement measures to control dust and other construction-related air quality impacts.	Specific measures are proposed to control air quality impacts during construction. Refer to the Construction Management Plan for details.
1-10	I encourage the Proponent to require contractors to install emission control devices on all off-road construction vehicles in an effort to reduce emissions of volatile organic	The Proponent will encourage contractors to comply with MassDEP's "Diesel Engine Retrofits in the Construction Industry: A How To Guide" and the use of ultra-low

Code	Comment	Response
	compounds (VOCs), carbon monoxide (CO) and particulate matter (PM) from diesel-powered equipment.	sulfur diesel in off-road engines. Construction vehicles will be required to comply with all applicable laws and regulations regarding engine idling and shall minimize any such idling. The construction contractor will be encouraged to use equipment fitted with diesel oxidation catalysts (DOC) or diesel particulate filters (DPF) to reduce emissions. DOCs can reduce fine particulate matter (PM) by 25%, carbon monoxide by 60%, and volatile organic compounds (VOCs) by 60%. DPFs can reduce fine PM by 85% or more as well as providing smaller reductions in carbon monoxide and VOCs.
1-11	All construction activities should be undertaken in compliance with the conditions of all State and local permits.	The Proponent will obtain and comply with the conditions of all required local and Commonwealth permits, as discussed in Section 1.4.
1-12 and 1A-12	The DEIR should discuss steps the Proponent has taken to further reduce the impacts of the project since the filing of the EENF [and the NPC], or, if certain measures are infeasible, the DEIR should discuss why these measures will not be adopted.	Each section of the Draft EIR describes the measures considered to reduce negative effects, those chosen for the Project, and those rejected for cost or feasibility.
1-13	The DEIR should include a detailed description of the Full-Build project and describe any changes to the project since the filing of the EENF.	Detailed information is provided in Chapter 1.0 regarding the previous EENF and NPC filings, changes since those filings as well as details for the current full-build Project.
1-14	The DEIR should include updated site plans for existing and post-development conditions at a legible scale. Conceptual plans should be provided at a legible scale and clearly identify site elevations, impervious and altered areas, retaining walls, pedestrian and bicycle accommodations, wetland resource areas, stormwater and utility infrastructure, and roadway improvements.	Detailed information is provided throughout the Draft EIR for all of the above aspects of the Project. Figures are embedded in the text for the benefit of the reader, and relevant larger-scale plans are found in Appendix A.
1-15	These conceptual plans should include not only on-site work, but any proposed off-site work associated with transportation improvements.	Conceptual plans have been developed for each off-site location where roadway/intersection geometry changes are proposed. These improvements are shown in Figure 29, Figure 30, and Figure 31 in the Draft EIR.

Code	Comment	Response
1-16	The DEIR should include also a discussion of permitting requirements associated with the Full-Build project and how the project will be constructed in accordance with applicable regulatory performance standards.	Each section of the Draft EIR discusses the permitting requirements associated with its topic and describes how those requirements and performance standards will be met.
1-17 and 1A-17	The DEIR should indicate whether a sewer extension greater than 1,000 feet in length will be required in association with the project given the revised residential program and recent changes to the MassDEP Sewer System Connection and Extension Program (April 25, 2014). If a Sewer Extension Permit from MassDEP is required, the DEIR should respond to the specific wastewater-related comments provided by MassDEP.	Information regarding the anticipated Local, State, and Federal permits is included in Section 1.4. A Sewer Extension Permit is not required or anticipated for the Project.
1-18	The DEIR should include existing and proposed conditions plans that conceptually identify proposed areas of cut and fill, areas of anticipated bedrock that may be impacted by site development, and clearly identify elevation changes between parking areas, buildings and site driveways.	Plans are provided to indicate existing and proposed topography in a general manner. Approximate building floor elevations are also indicated. Refer also to Chapter 3 for detailed discussion regarding subsurface information, earth moving, and bedrock removal.
1-19	The DEIR should address how the project layout limits blasting of bedrock and limits the overall exportation of fill from the project site.	The Project is designed to minimize earth moving and bedrock removal by creating multiple building and parking levels that respond to the existing topography. The Project will be designed to balance cuts and fills to the maximum extent practicable. Refer also to Chapter 3 for detailed discussion regarding subsurface information, earth moving and bedrock removal.
1-20	The DEIR proposed conditions plan should clearly identify the limit of clearing on-site.	Details are provided on the plans and within the text to indicate the limits of clearing.
1-21	The DEIR should demonstrate that the amount of tree/vegetation clearing will be limited to the maximum extent practicable.	Due to the topographic relief of the site, the majority of the existing vegetation will be removed. Wherever possible, mature vegetation will be retained at the perimeter of the Project site.
1-22	As the project site is heavily wooded, the Proponent should seek to retain existing vegetated cover between buildings on-site, as well as abutting properties.	
1-23	The DEIR should indicate if supplemental landscaping or tree planting will be provided	As evidenced by the Project name, "the Grove," the Proponent intends to place a

Code	Comment	Response
	to mitigate clearing required to facilitate construction.	strong emphasis on landscaping. Approximately 8.4 acres (27%) of open space will be provided. These areas include a large center green area labeled as "the Quad at the Grove" on the master plan, as well as significant green areas along the Route 9 and Oak Street frontage. The number of tree plantings will far exceed that which is required under the bylaw.
1-24	Finally, the DEIR should describe any necessary temporary or permanent easements or land takings associated with each the Preferred Alternative, especially in association with potential roadway improvements.	At this time, the only required changes to the public ROW for proposed improvements are on northwest side of Maple Avenue (at the Fairlawn Plaza) and potentially on the west side of Oak Street (at The Grove Project site). These potential takings are discussed in Section 7.3 of the Draft EIR.
1-25	The DEIR should include an updated transportation study prepared in conformance with the EOEEA/MassDOT Guidelines for Transportation Impact Assessments.	The updated transportation study has been completed and is included as 7.0 in the Draft EIR.
1-26	This [internal site circulation] plan should also identify key connection points to off-site uses such as the bus stop and Fairlawn Plaza. Identification of site elevations on this plan is critical to the assessment of viable pedestrian and bicycle circulation patterns throughout the project site.	The Proposed Transit, Pedestrian, and Bicycle Access Plan (Figure 28) provides details of the circulation routes both on site and connectivity to adjacent elements. The plan allows for uninterrupted bicycle circulation to and from upper and lower uses.
1-27	In some cases, grade changes may impede access between various uses on-site. The DEIR should discuss how these challenges have been considered in the preparation of the Preferred Alternative.	Due to the topographic relief of the site, there are multiple levels of building floor elevations and parking areas. The levels will be connected via internal elevators, escalators, and stair systems, in addition to exterior stair systems to connect pedestrian walkways and plaza areas. The plan also allows for uninterrupted bicycle circulation via internal roadways.
1-28 and 1A-28	The DEIR should explore the implementation of additional TDM measures recommended by MassDOT [and MassDEP] and elaborate on how the Proponent can enhance the likelihood of successful implementation through mandating adoption of TDM elements in lease agreements and/or provide specifics on how tenants will be encouraged to adopt the elements of the	The Project Proponent will strongly encourage tenants to adopt the TDM measures discussed in Section 7.3 of the Draft EIR. From a business point of view and given the type and location of the proposed development, requiring tenants to implement TDM measures as part of a lease is not feasible.

Code	Comment	Response
	TDM program.	
1-29 and 1A-29	The DEIR should also provide additional detail on [any] proposed Parking Management Program including how it will be implemented and overall goals.	A discussion of the proposed on-site parking is included in Section 3.2.4 of the Draft EIR.
1-30	The Proponent should conduct this mesoscale analysis and present its results in the DEIR. The Proponent should consult with MassDEP regarding modeling protocol prior to conducting this analysis.	The mesoscale analysis has been done as requested, following the MassDEP modeling protocol.
1-31	The mesoscale analysis should be used to meet the GHG Policy requirement to quantify project-related CO2 emissions and identify measures to avoid, minimize, and mitigate these emissions.	The mesoscale analysis includes quantifying Project CO_2 emissions and evaluating TDMs to reduce those emissions.
1-32	The mesoscale analysis will also be used to determine if the project will be consistent with the Massachusetts State Implementation Plan (SIP).	The mesoscale analysis has determined the Project is consistent with the Massachusetts SIP.
1-33	Emission increases due to the project must be mitigated and any subsequent environmental impact analysis should include the Proponent's commitment to implement these mitigation measures.	Mobile source emissions due to the Project are mitigated by the proposed package of transportation demand management (TDM) commitments.
1-34	Implementation of a TDM program on-site will provide an opportunity for additional air quality improvements through a reduction in trips. TDM measures and their ability to reduce trip generation rates will be evaluated in the DEIR as part of the transportation analysis.	The TDM program is discussed in detail in Section 7.3 of the Draft EIR.
1-35	The DEIR should include an updated GHG stationary source analysis prepared in accordance with the GHG Policy to demonstrate that the project has been designed and will be constructed in a manner that avoids, minimizes and mitigates project-related GHG emissions.	The updated GHG analysis was prepared in conformance with the MEPA GHG Policy and Procedures.
1A-35A	The Proponent must meet with MEPA staff and representatives from the Department of Energy Resources (DOER) prior to preparation and submission of the GHG analysis to	The Proponent's consultants had a conference call with MEPA staff and a representative of DOER regarding modeling methodology, prior to updating the GHG

Code	Comment	Response
	confirm assumptions and overall modeling methodology.	report.
1-36	Based upon the modeling results in the EENF, it appears that there additional opportunities to reduce GHG emissions through the adoption of additional technologies and/or the implementation of more aggressive core and shell improvements.	The Draft EIR includes an updated GHG analysis that provides additional stationary source emission reductions. The following energy efficiency measures have been added since the EENF: (1) Increased insulation for the building shell with R30 roof insulation for all commercial buildings; (2) Use of LED lighting for parking garages and lots; (3) Energy STAR hot water heaters for the multi-family residential building; (4) Reduced light power density for the single-family residential units.
1-37	While I acknowledge that the Proponent has met the requirements of the MEPA GHG Policy by selecting a Base Case building code consistent with that in effect at the time of the EENF submission, I strongly encourage the Proponent to reconsider and use the IECC 2012 and ASHRAE 90.1-2010 as the project Base Case.	The updated GHG study uses the 9th Edition of the Building Code as its Base Case, equal to IECC 2012.
1-38	The DEIR should also confirm that the appropriate CO2 emission rate for natural gas is used in the analysis and revise calculations accordingly. [The EENF used an emission rate of 120.6 lb/10^3 cubic feet of natural gas, citing the Energy Information Administration (EIA) data. The EIA data reviewed by the MEPA Office indicated an emission rate of 117.1 lb/10^3 cubic feet.]	The EIA emission factor is 117.1 lb per million Btu and this has been used in the updated GHG study.
1-39 and 1A-39	While Shrewsbury has not adopted the Commonwealth of Massachusetts' Stretch Energy Code (Stretch Code), I strongly encourage the Proponent to aim for energy reductions consistent with those in the Stretch Code when advancing the design process. [A revised Stretch Code (SCII) is expected to be proposed by the BBRS. SCII is anticipated to require energy use in new large buildings to be 12 to 15 percent below the baseline of IECC 2012 (ASHRAE 90.1-2010).]	Despite the fact that Shrewsbury has not adopted the Stretch Code and this Project is not subject to its requirements, the Project's overall energy reduction from the IECC 2012 Base Case is substantial at 16.3%. In addition, several Energy Efficiency Measures (EEMs) adopted by the Project for commercial buildings are better than the Stretch Code (SC): • Roof insulation at R30 exceeds SC of R25. • Wall insulation of R13+R13ci exceeds SC of R13+R7.5ci. • Window Heat Transfer Coefficient of

Code	Comment	Response
		U=0.35 exceeds SC of U=0.45. • HVAC (10-ton unit) EER of 11.8 exceeds SC of 11.3.
1-40 and 1A-40	The DEIR should consider: use of wall insulation with higher R-values than Code; installation of higher-efficiency HVAC systems; use of variable frequency drive (VFD) fans; adoption of high-efficiency (light-emitting diode (LED) or fluorescent) interior and exterior lighting with lighting power densities greater than [15] percent below Code; and, identification of water use reduction goals for the shower facilities in the fitness center or those provided in other buildings for employee use.	Wall insulation for commercial buildings has been increased from R13+R7.5ci to R13+R13ci. High-efficiency HVAC units that meet the stringent requirements of the IECC 2012 Code will be used; the Proponent estimates that going beyond this efficiency level would cost $0.4 million more for the Project and thus exceeding current Code for HVAC units is financially infeasible. VFD fans are generally used on very large (>70 ton) HVAC units and this measure is not applicable to the smaller units that will be installed for the tenants in this Project. LED lighting will be used for the parking garage and parking lots. The interior lighting design has not been finalized at this conceptual stage in the design. Some LED lights may be used in interior space. The fitness center is no longer part of the Project.
1-41	In addition, the DEIR should clarify how orientation of building exteriors will be designed on a façade-by-façade basis for optimal configuration of glazing area and opaque walls.	The façades of the buildings have not yet been designed and thus no details on glazing or opaque wall sections are available at this time.
1-42	Based upon the modeling results in the EENF, it appears that the redevelopment of the Chelmsford/Spag's facility includes the replacement of all systems, windows, and lighting. The DEIR should confirm that these changes can be achieved in a manner consistent with modeling given the potential constraints of refurbishing an historic structure.	The planning for full replacement of glazing with modern, efficient windows and the installation of insulation wherever practical should easily exceed the modest goals for energy efficiency set in the Building Code and reflected in the modelling.
1-43	The DEIR should provide additional discussion and analysis associated with the proposed construction of single-family homes.	The two single-family residences will be constructed in a manner generally consistent with LEED for Homes. The following design features of those homes are consistent with the Program Requirements for Energy STAR Certified Homes, version 3.1

Code	Comment	Response
		in Massachusetts: • Cooling equipment. E-Star requires SEER 13. The Project air conditioning units will meet or exceed this standard. • Roof/ceiling insulation. E-Star requires R49. The Project will build R49. • Wall insulation. E-Star requires R20. The Project will build R20. • Slab insulation. E-Star requires R10. The Project will build R10. • Basement wall insulation next to conditioned space. E-Star requires R15 continuous. The Project will build R15 continuous. • Household and kitchen appliances. E-Star requires Energy STAR certified appliances. The Project will install Energy STAR certified appliances.
1-44	The DEIR should clarify what construction elements will be controlled by the developer (e.g., core and shell improvements, HVAC system selection, etc.) versus those elements that will be deferred to the tenant fit-out process.	The developer will provide the building shell, and depending on the tenant, the HVAC and lighting systems may be provided by either the developer or the tenant.
1-45	If tenants will have a choice of systems, appliances or other energy efficiency measures modeled in the GHG analysis, the DEIR should identify how the Proponent will ensure selection of models consistent with the eQUEST analysis.	The Tenant Manual will outline these requirements.
1-46	If tenants will only have selection of additional energy-efficiency or GHG reduction measures such as low-flow fixtures, low or no VOC paints, and lighting fixtures, the DEIR should describe how the Proponent will encourage homeowners to select these products during fit-out, if applicable.	The Tenant Manual will outline these requirements.
1-47	I strongly encourage the Proponent to construct these homes in a manner consistent with either the Leadership in Energy and Environmental Design (LEED) for Homes… or EnergyStar for Homes…. The DEIR should discuss how the modeled design	See response to 1-43.

Code	Comment	Response
	features for the residences are consistent or inconsistent with the design standards for participation in these programs.	
1-48	The DEIR should provide additional analysis of alternative installation types that are not constricted to a single large block of PV panels. I encourage the Proponent to consult with third-party vendors to discuss how smaller on-site systems could be aggregated in a cost-efficient manner.	Third-party vendors generally consider 200-kW to be the minimum size for a financially-feasible commercial system. Smaller scale PV systems have a higher installed cost and thus are less cost-effective than the 200-kW PV system evaluated in the GHG report. When smaller blocks of cells are aggregated on a building roof, the installation cost rises because of the need for multiple inverters.
1-49	At a minimum, the DEIR should include a commitment to construct every roof as "solar-ready," not just Buildings A and B (Phase 1 and the Chelmsford/Spag's facility).	The Proponent will ensure each commercial building with a flat roof will have solar-ready space.
1-50	The DEIR should tabulate available rooftop areas that could be set aside for PV systems with consideration for required mechanical space and rooftop access. The DEIR should summarize available square footage and include graphics identifying the proposed location of each use.	The specific rooftop areas that might be available for a possible future third-party PV installation are not known at this time because the Project is at a conceptual level of design and no roof layout plans have been done for mechanical equipment and access points.
1-51	The DEIR should estimate the amount of power that could be generated from the installation of PV panels on each available project roof space, the potential offset of project-related energy use, and associated GHG reduction.	See response 1-50.
1-52 and 1A-52	I encourage the Proponent to use the National Renewable Energy Laboratory's (NREL) PV Watts 2 model to estimate maximum potential PV output. All supporting data sources and assumptions should be clearly cited in the DEIR.	PV Watts 2 is only useful when one knows the available area for solar arrays. Since the specific rooftop areas that might be available for PV are not know at this time because the Project is at a conceptual level of design and no rooftop layout plans have been done for the mechanical equipment, the key inputs for PV Watts 2 are not available.
1-53	Based upon the conceptual design of the houses [and the apartment building] (i.e., square footages, estimated natural gas and hot water demands), the DEIR should iden-	The building program has changed so there is no longer a single, large multi-family residential building. The total of 138 units are now spread over four commercial buildings

Code	Comment	Response
	tify how the potential hot water heating demand may be offset through the implementation [of ground source heat pumps (GSHP) and solar hot water (SHW) panels].	(Buildings D, E, G and H), which also have retail and office uses. The possible use of water-source heat pumps for these residential units depends on subsurface conditions, which have yet to be tested. Heat pumps, along with any NSTAR or State government cost incentives, will be considered in the detailed mechanical systems design for the residential components. Depending on the available roof area on the mixed-use buildings, solar hot water panels for the residential units may be suitable. This measure, along with any NSTAR or State government cost incentives, will be considered in the detailed mechanical systems design for the buildings.
1-54	The DEIR should provide estimates of system sizing, displaced natural gas demand, and associated GHG reductions for each potential [GSHP and SHW] system.	The Project is only at a conceptual stage of design, and the detailed data needed for these calculations are not available.
1-55	The DEIR should include a commitment to a specific Construction Waste Management goal, and establish similar waste management goals as part of ongoing operations that could be memorialized in leasing agreements.	See response to 1-8.
1-56 and 1A-56	The DEIR should clarify the anticipated water demand associated with on-site irrigation. While the EENF notes that irrigation demand will be minimized through the use of native, drought-tolerant plants, the DEIR should evaluate the use of small, localized stormwater capture systems (such as cisterns or rain barrels) to eliminate the use of potable water for irrigation purposes in its entirety.	It is estimated that irrigated areas will be no greater than 2 acres in aggregate. These areas will be limited to core areas of the Project or where significant landscape materials are proposed. All irrigation water will be derived from an on-site irrigation well(s); no municipal water will be used for irrigation purposes. The Proponent will evaluate the use of subsurface cisterns or rain barrels as a means to reduce irrigation demands in smaller landscaped areas.
1-57	The DEIR should confirm that the modeling of elements specifically delegated to the tenant fit-out process are consistent with those that will be mandated as minimum requirements in the Tenant Manual and lease agreements.	The energy modeling of these elements is consistent with the items mandated in the draft Tenant Manual.
1-58	It is unclear what means will be employed by the Proponent to assist future tenants in	See the draft Tenant Manual.

Code	Comment	Response
	selecting energy reduction measures during fit-out. The Proponent may provide design assistance, offer financial incentives, or provide a list of approved fit-out material performance standards to facilitate this effort.	
1-59	Many of the items that the EENF identify as being encouraged by the Proponent for adoption by future tenants can and should be mandated in the Tenant Manual (e.g., occupancy controls for lighting, use of water-conserving fixtures, use of Energy Star-rated appliances, collection and recycling of cans, bottles and office paper).	An attempt to mandate controls or behaviors to commercial tenants, or dictate what equipment could or could not be used, would damage the Proponent's ability to lease commercial space in the Project.
1-60	I strongly encourage the Proponent to revise the proposed Tenant Manual to require these fit-out and operational practices.	See Response to 1-59.
1-61	(Replaced by 1A-56)	N/A
1-62	[T]he Proponent should use U.S. EPA's COMMUTER and Work Trip Reduction Model or Congestion Mitigation Air Quality (CMAQ) worksheets from MassDOT to estimate reasonable trip reductions associated with TDM programs.	A comprehensive TDM program that is feasible and practical given the proposed site uses and suburban location was prepared. The mix of uses facilitates the potential for significant internal capture as well as shared parking supply. The TDM program will encourage bicycle trips and transit use to and from the site. However, at best, the TDM program would be expected to reduce peak hour external trips by less than five percent and not result in any substantive effect on intersection operations. Thus, the off-site intersection improvements have been proposed to reduce congestion and improve safety. All roadway-related improvements would consider Complete Streets principles.
1-63	Reductions in GHG emissions associated with improved LOS and reduced idling times may also be calculated using the results of the mesoscale analysis.	This level of refined analysis is not warranted for the proposed TDMs, for which only general volume-reducing benefits are known.
1-64	The DEIR should include a revised mobile source emissions analysis to accurately reflect potential GHG emissions reductions associated with the proposed transportation	A revised mobile source emissions analysis is provided in the Draft EIR GHG report. The reduction in Project-related mobile source emissions from TDM measures has been re-evaluated and the reduction revised

Code	Comment	Response
	improvements and TDM program.	to 2 percent with a reference for the calculation given in the GHG report.
1-65	The DEIR should confirm that there are no regulated wetland resource areas or associated buffer zones associated with the remaining Full-Build portion of the project. This assessment should include areas that may be impacted by off-site transportation improvements.	There are no other resource areas on-site other than the one identified. The only known resource area buffer zone that will be altered as part of off-site improvements is associated with the wetland area located on the New England Power Company land to the west of the Project site. Some minor buffer zone disturbance is anticipated for sidewalk improvements along the north side of Route 9. No direct resource area alteration will occur as a result of off-site improvements.
1-66	If the project will include work in wetland resource areas or buffer zones, the DEIR should identify the location of these wetlands, characterize wetland resource areas, quantify permanent and temporary impacts to State-jurisdictional wetland resource areas, and demonstrate how the project will meet applicable performance standards in the WPA. The DEIR should identify BMPs or other mitigation measures to avoid, minimize and mitigate damage to these wetland areas and note if post-construction restoration activities will be required.	The Project site contains a small bordering vegetated wetland (3,850+/-sf) and associated intermittent stream located in the approximate center of the site. Approximately 2,200 square feet is proposed to be permanently altered to accommodate the Project. A replication area is proposed to mitigate the alteration. Refer to Chapter 4 for details of the existing resource areas and the proposed replication area.
1-67	The DEIR should include an updated stormwater management report, as necessary, to reflect any substantive site design and layout changes since the filing of the EENF [and NPC] and in response to MassDEP comments on the EENF and the NPC]..	A comprehensive stormwater management report has been prepared for the current site design. Refer to Chapter 5 for additional details and Appendix C for the full Stormwater Management Report
1A-67A	This stormwater analysis should demonstrate that the project will be designed in compliance with the MassDEP Stormwater Management Regulations.	The proposed stormwater management system is designed in full compliance with applicable MassDEP regulations and standards.
1-68	The DEIR should reassess the feasibility of bioswales, rain gardens, or other LID techniques that may be facilitated by implementing similar construction techniques proposed for subsurface infiltration. If adopted, the proposed drainage conditions plan, operations and maintenance plans	Proponents of projects subject to the Stormwater Management Standards must consider LID techniques to management stormwater. The Project proposes localized subsurface infiltration systems positioned throughout the Project site to mimic existing hydrologic conditions. Please refer to the

Code	Comment	Response
	and stormwater calculations should be revised accordingly.	Low Impact Development (LID) Considerations section of the Stormwater Management Report in Appendix C for additional details.
1-69	The DEIR should specifically identify operations and maintenance efforts for these [subsurface infiltration system] BMPs and indicate the frequency of and responsibility for their ongoing maintenance.	In accordance with Standard 9 of the Stormwater Management Regulations, the Stormwater Management Report in Appendix C identifies specific operation and maintenance requirements for each type of BMP proposed for the Project.
1-70	Design modifications to these infiltration systems should be made in accordance with the MassDEP recommendations and reflected in the DEIR.	The proposed design includes the MassDEP's recommended design modifications, including inspection reports and overflow pipes where required by the design. Please refer to comment response 3-13 for additional information.
1-71	According to the comment letter from the Town, there are existing drainage and flooding issues on Maple Avenue near the southern portion of the property. The DEIR should discuss how stormwater improvements will alleviate this issue and confirm that roadway and drainage improvements will serve to reduce flooding potential.	A portion of the existing Project site contributes runoff directly to Maple Avenue along with an additional 4.5 acres of off-site land northeast of the Project site. The Project is proposing to redirect these flows that are likely contributing to the flooding problems within Maple Avenue. A drainage trunk line is proposed to be constructed on the subject property from the northwest corner of the Project site to the southwest corner of the site. This proposed mitigation will remove about 7.4 cfs of contributing flow from the Maple Avenue drainage system during a 25-year design storm.
1-72	The DEIR should provide an update on the MHC consultation process regarding partial demolition and restoration of the Chelmsford/Spag's facility…. As appropriate, the DEIR should identify mitigation measures to avoid, minimize, or mitigate impacts to historic resources.	Initial consultation with the MHC has led to general agreement with the proposal to rehabilitate and reuse the Chelmsford Building. Section 2.3 provides details on the measures to reduce negative effects.
1-73	The DEIR should also describe potential project area construction period impacts (including but not limited to traffic management, materials management, parking, air quality and noise impacts, and other items as they related to the construction period) and analyze and outline feasible measures that can be implemented to eliminate or	Specific measures are proposed to control and minimize construction period impacts including traffic, materials, air quality and noise related impacts. Please refer to Appendix G – Draft Construction Management Plan for details.

Code	Comment	Response
	minimize these impacts.	
1-74	The DEIR should indicate whether blasting will be required, address potential impacts associated with noise and vibration and identify mitigation measures.	The Draft EIR provides information to address construction related impacts and mitigating measures. Refer to Chapter 3 and the Construction Management Plan in Appendix G for details.
1-75	The DEIR should include a draft Construction Management Plan (CMP) to demonstrate how construction period impacts will be mitigated.	A Draft Construction Management Plan is provided in Appendix G.
1-76	Specifically, the DEIR should identify truck traffic routes associated with construction traffic, staging areas, and how safe pedestrian, bicycle and vehicle access throughout the project area will be maintained throughout the construction period.	The expected construction truck routes are discussed in Section 9.1 of the Draft EIR. Construction staging areas will be identified during design development and will be designed to assure safe pedestrian, bicycle, and vehicular access.
1-77	The DEIR should present a conceptual plan with a list of BMPs that could be selected by project contractors to reduce construction related environmental impacts. These BMPs should focus on erosion and sedimentation controls, staging areas, traffic management, and air/noise pollution.	The Draft Construction Management Plan outlines specific BMPs that are required to be implemented by contractors during construction including sediment and erosion controls, solid waste, and staging areas.
1-78	The DEIR should also discuss potential construction period dewatering activities and related permitting requirements.	The Draft Construction Management Plan in Appendix G provides information pertaining to dewatering activities and related requirements.
1-79	The Proponent must comply with MassDEP's Solid Waste and Air Quality Control regulations, pursuant to M.G.L. Chapter 40, Section 54, during construction.	As required, the proposed Project will comply with MassDEP's Solid Waste and Air Quality Control regulations. Please refer to the Construction Management Plan in Appendix G for specific details.
1-80 and 1A-80	The DEIR should outline potential measures to address materials management during the construction period, including recycling of construction and demolition (C&D) waste and handling of asphalt, brick and concrete (ABC) associated with demolition activities [and comply with the goals of the Massachusetts Solid Waste Master Plan].	The Draft EIR and Appendix G (Draft Construction Management Plan) outline potential measures to manage materials during construction including waste materials, ABC, and other materials to be recycled.
1-81	The DEIR should also confirm that existing pavement areas will be removed and either	Asphalt, brick, and concrete (ABC) must also be handled in accordance with the

Code	Comment	Response
	reused on-site or appropriately disposed of in accordance with MassDEP regulations.	Massachusetts solid waste regulations. In accordance with the regulations, ABC can be taken directly to a recycling operation with no permit or notification to MassDEP. ABC can also be crushed at the site in accordance with the conditions in 310 CMR 16.05(3). The contractor must notify MassDEP and the Shrewsbury Board of Health at least 30 days prior to starting the crushing operation in accordance with 310 CMR 16.03(2)(b)5.
1A-81A	I strongly encourage the Proponent to set solid waste recycling/reuse target percentage goals. This information may be included as part of a larger draft Construction Waste Management Plan for the project.	The developer is targeting the maximum practical reduction in construction debris. Additional details on recycling and reuse are included in the Construction Management Plan in Appendix G.
1-82	Erosion and sedimentation controls should be implemented and maintained in accordance with the Stormwater Pollution Prevention Plan prepared in accordance with the NPDES Construction General Permit requirements.	A draft Stormwater Pollution Prevention Plan (SWPPP) is included within the Stormwater Management Report in Appendix C to show compliance with Standard 8 of the Stormwater Management Regulations. The SWPPP outlines specific erosion and sediment controls to be installed and maintained throughout construction.
1-83	The Proponent is advised that, if sources of oil and/or hazardous material (OHM) are identified during the implementation of the project, notification pursuant to the MCP (310 CMR 40.0000) must be provided to MassDEP, if necessary.	At present, there are no known sources of oil or hazardous materials on the site of the Grove. Should any be discovered during construction, proper and timely notice will be provided to the MassDEP and the MCP will be followed in any needed clean-up.
1-84	The DEIR should include a separate chapter summarizing proposed mitigation measures.	Chapter 9.0 provides a consolidated summary of mitigation measures, with details provided in the individual Chapters.
1-85	The DEIR should include draft Section 61 Findings for each anticipated State Agency Action.	At present, only MassDOT permits appear to be required. Appendix E contains draft Section 61 Findings for these permits.
1-86	The DEIR should contain clear commitments to implement these mitigation measures, estimate the individual costs of each proposed measure, identify the parties responsible for implementation, and a schedule for implementation.	Chapter 9.0 describes the mitigation measures to be adopted, along with the schedule for implementation and the responsible party. The Proponent will carry out most mitigation directly, though some GHG measures will be the responsibility of the tenants.

Code	Comment	Response
1-87	In order to ensure that all GHG emissions reduction measures adopted by the Proponent in the Preferred Alternative are actually constructed or performed, I require proponents to provide a self-certification to the MEPA Office indicating that all of the required mitigation measures, or their equivalent, have been completed.	At the completion of construction, the Proponent will provide a certification to the MEPA Office, signed by an appropriate professional, identifying either: 1) all of the energy efficiency mitigation measures adopted by the Project as part of the Mitigation Alternative have been implemented; or 2) an equivalent set of energy efficiency mitigation measures that together are designed to achieve the same percentage reduction in GHG emissions as the Mitigation Alternative, based on the same modeling assumptions in this report, have been adopted.
1-88	The commitment to provide this self-certification in the manner outlined above should be incorporated into the draft Section 61 Findings included in the DEIR.	The commitment will be incorporated into the draft Section 61 Findings included in the Draft EIR.
1-89	I note that in conjunction with the request for a Phase 1 Waiver, the Proponent agreed to provide a self-certification, consistent with the requirements outlined above, for the Phase 1 portion of the project upon completion. This requirement was incorporated into the draft Section 61 Findings provided for the MassDOT permitting process.	The Proponent will provide a self-certification for the Masonic Lodge and the two single family homes.
1-90 and 1A-90	The DEIR should contain a copy of this Certificate [and the Certificate on the EENF] and a copy of each comment letter received [on both the EENF and the NPC].	Appendix H provides a full copy of the Certificates and all comments on the EENF and the NPC.
1-91 and 1A-91	In order to ensure that the issues raised by commenters are addressed, the DEIR should include direct responses to comments [on the EENF and the NPC] to the extent that they are within MEPA jurisdiction.	This tabular response to comments provides direct response to each identified comment, with details provided in the text of the Draft EIR.
1-92 and 1A-92	The Proponent should circulate the DEIR to those parties who commented on the EENF [and/or the NPC], to any State Agencies from which the Proponent will seek permits or approvals, and to any parties specified in section 11.16 of the MEPA regulations.	As can be seen in the Circulation List attached to the cover letter, these requirements have been met.
1-93	A copy of the DEIR should be made availa-	

Code	Comment	Response
	ble for review at the Shrewsbury Public Library.	
1A-94	To save paper and other resources, the Proponent may circulate copies of the DEIR to commenters other than State Agencies in CD-ROM format or post to an online web-site, although the Proponent should make available a reasonable number of hard copies, to accommodate those without convenient access to a computer to be distributed upon request on a first come, first served basis. The Proponent should send a letter accompanying the CD-ROM or identifying the web address of the online version of the DEIR indicating that hard copies are available upon request, noting relevant comment deadlines, and appropriate addresses for submission of comments.	Where possible, the Draft EIR has been distributed electronically. Each electronic copy offers a hard copy, if needed.
MASSDOT – FEBRUARY 7, 2014 (COMMENT 2) **MASSDOT – JULY 29, 2014 (COMMENT 2A)**		
2A -1A	The proponent has also agreed to monitor traffic at Route 9 and Maple Avenue once per year until the EIR for Phases II, III, and IV of the project is submitted for MEPA review. The goals of the monitoring program will be to evaluate the assumptions made in the NPC Transportation Analysis and the adequacy of the mitigation measures, as well as to determine the effectiveness of the Transportation Demand Management (TDM) program. Its results should be used to develop and implement an updated program for the full project. The results of each iteration of the monitoring program should be summarized in a technical memorandum provided to the Town of Shrewsbury, Central Massachusetts Regional Planning Commission (CMRPC), and Mass-DOT.	Traffic monitoring has not been completed or needed, as the Project Proponent has not yet moved forward with construction on-site. A monitoring program is proposed when construction proceeds and the first building(s) are occupied.
2-1 and 2A-1	The DEIR should include an updated transportation study [of the Full Build Alternative] prepared in conformance with [the March 2014 MassDOT/EOEEA Transportation Impact Assessment (TIA) Guidelines].	The updated transportation study has been completed and is included as Chapter 7.0 in the Draft EIR.

Code	Comment	Response
2-2 and 2A-2	The study should include a comprehensive assessment of the cumulative transportation impacts of [each phase] of the project, based on a thorough analysis of existing conditions, future No-Build conditions, and future Build conditions.	The updated traffic study in the Draft EIR evaluates the full build and the cumulative transportation impacts of all phases of the proposed Project.
2-3	The DEIR should include a comprehensive mitigation program that is intended to offset most of the adverse impacts of the project.	The proposed off-site mitigation is discussed in Section 7.3 of the Draft EIR.
2-4 and 2A-4	In particular, the DEIR should reevaluate the following state highway locations and propose improvements that would mitigate project impacts: • The Route 9/Oak Street intersection; • The Route 9/Maple Avenue intersection; • The Route 9/Harrington Avenue/Svenson Road intersection; and • The Route 9/Lake Street intersection. [There is concern that weekday PM peak hour queues may frequently build up on Route 9 at Harrington Avenue, blocking upstream side streets and driveways in each direction.]	The proposed off-site mitigation at the Route 9 / Oak Street and Route 9 / Maple Avenue intersections include geometric improvements and upgrades to and/or replacement of the traffic signal equipment. The proposed mitigation at the Route 9 / Harrington Ave / Svenson Rd intersection and the Route 9 / Lake Street intersection consists are traffic signal timing optimization.
2-5	The DEIR should conduct further analysis for those study area intersections having crash rates higher than the State and/or District 3 average. The analysis should include a discussion of causality, suggestions for mitigation, and commitment to implementing this mitigation.	The crash history at each studied intersection is discussed in Section 7.1.2 of the Draft EIR. There were six locations exceeding the average District 3 crash rate and these locations are discussed in more depth/
2-6 and 2A-6	Back-up data should be provided to support the pass-by and internal capture rates used in the TIAS [for the Full-Build analysis (i.e., from NCHRP Report 684 and the ITE Trip Generation Handbook)]. The ITE Land Use Code used to estimate trips for the assembly space should be verified.	Supporting data for pass-by rates and internal capture rates are provided in the Transportation section appendix. The ITE Land Use code for the assembly space, and the trip generation for the Project as a whole, have been revised and updated.
2-7 and 2A-7	The trip distribution/traffic assignment for the fully-built project should be revised, as necessary, to reflect changes to the originally proposed site access plan (as dis-	Trip distribution patterns have been revised, with different travel patterns for the various land uses (retail/commercial, office, and residential). The revisions also incorporate

Code	Comment	Response
	cussed in the Supplemental Information). [The EENF trip distribution/traffic assignment should be reviewed for consistency with the revised development program, in terms of it being reflective of the types of land uses being proposed. Any changes should be incorporated into the study area traffic volumes and intersection operations analyses for the Build condition.] The revised distribution/assignment should be presented graphically in the DEIR.	changes in the proposed site driveways and internal site layout changes. The report illustrates in detail these forecast estimates.
2-8 and 2A-8	The intersection operations analysis (level-of-service [LOS], volume-to-capacity ratio [V/C], lane group/turning movement/entire intersection delay, and 50th and 95th percentile queues) presented in the EENF for the fully-built project should be updated [on a cumulative basis for each phase of the project], as needed, to reflect the revised trip distribution/assignment.	The intersection capacity analyses have been updated, and are summarized in Section 7.2.2 of the Draft EIR.
2-9	The DEIR should present a tabular as well as an illustrative color-coded summary of this [operations analysis] information.	All of the operating conditions are presented in tabular format. Additionally, a color coded map that summarizes traffic operations at each intersection is provided in Figure 25, Figure 26, and Figure 27.
2-10 and 2A-10	Any proposed traffic signal [or left-turn lane] must include a traffic signal warrant study (TSWS) conducted according to standards set forth in the Manual on Uniform Traffic Control Devices (MUTCD) [and the American Association of State Highway and Transportation Officials' A Policy on Geometric Design of Highways and Streets, respectively].	The proposed mitigation does not include traffic signal control at any intersection that is currently unsignalized.
2-11	Mitigation proposals presented in the EENF should be updated to reflect traffic operations with the revised access plan in place.	The proposed mitigation has been revised based on the changes to the site access and changes in the size of the proposed Project. The proposed mitigation is discussed in Section 7.3 of the Draft EIR.
2-12	The DEIR should clearly identify any study area intersections that will operate below acceptable levels of service, either for a lane group/turning movement or for the entire intersection, following completion of the project.	The intersection capacity analyses are summarized in Section 7.2.2 of the Draft EIR.

Code	Comment	Response
2-13 and 2A-13	A commitment to mitigation should be made at each of these locations, as feasible and appropriate. [Mitigation should be designed and constructed as warranted for each phase of the project. Unless otherwise agreed by MassDOT, phase-specific mitigation should be in place prior to phase occupancy.]	Mitigation is proposed at each location where it is feasible and appropriate to do so.
2-14	The internal site circulation plan should provide accommodations for both pedestrians and bicycles. The site plan must clearly show the location of sidewalks and bicycle racks. Site sidewalks should provide pedestrian access to the different uses on-site via the proposed site driveways.	The internal site circulation plan is shown on Figure 28. Pedestrian paths and bicycle rack locations are shown.
2-15	In addition to the restricted use (right-in only) proposed for the easterly site driveway on Route 9 as part of Phase I, the proponent has committed to consolidate the two northernmost Maple Avenue driveways from the originally access proposal as part of the full-build project.	The proposed driveways on Route 9 and on Maple Ave have changed. The current site design includes two driveways on Route 9: the eastern driveway is proposed to be a right-in/right-out driveway, while the western driveway on Route 9 is proposed to be a right-out only driveway. The current site plan proposed two primary driveways on Maple Ave, a separate driveway to serve the relocated Mason's Lodge, and retaining the existing residential driveway. The Project Proponent met with MassDOT District 3 staff on January 22, 2015 to provide MassDOT an update on the site design as well as to get input from MassDOT regarding driveway locations and functionality.
2-16	The DEIR should include sufficiently detailed conceptual plans (preferably 80-scale) for proposed roadway improvements in order to verify the feasibility of constructing improvements. These plans should clearly show proposed lane widths and offsets, layout lines and jurisdictions, and land uses (including access drives) adjacent to areas where improvements are proposed.	Conceptual plans have been developed for each off-site location where roadway/intersection geometry changes are proposed. These improvements are shown in Figure 29, Figure 30 and Figure 31.
2-17 and 2A-17	Any proposed mitigation within the state highway layout and all internal site circulation must be consistent with a Complete Streets design approach that provides adequate and safe accommodation for all	All of the proposed geometric improvements are consistent with the Complete Streets design approach. The proposed improvements are shown in Figure 29, Figure 30 and Figure 31.

Code	Comment	Response
	roadway users, including pedestrians, bicyclists, and public transit riders. Guidance on Complete Streets design guidelines is included in the MassDOT Project Development and Design Guide. [Where these criteria cannot be met, the proponent should provide justification, and should work with the MassDOT Highway Division to obtain a design waiver.]	
2A-17A	The TIA should explain the derivation of the proposed parking supply for the project. The number of proposed spaces should be compared to the amount required based on information contained in ITE's Parking Generation (4th edition) as well as the requirements of local zoning codes.	The ITE parking rates are discussed in Appendix D – Traffic Impact and Access Study. Local parking requirements are presented in Section 3.2.4, and a substantial reduction in parking is sought.
2A-17B	The proponent should investigate land banking of parking spaces until and unless needed, based on monitoring conducted at a future date.	In lieu of land banking parking spaces, the Proponent intends to work closely with Town Officials to seek a reduction in the amount of overall parking. The current master plan represents a 23% reduction in the parking as compared to local zoning requirements.
2-18	The DEIR should provide a thorough inventory of all existing, planned, and proposed services, facilities, and routes for accessing the site using transportation modes other than single-occupancy vehicles. These include provisions for future expansion of public transit bus, private shuttle, bicycle, and pedestrian mobility options in the vicinity of the project.	The inventory of existing services and facilities is described in Section 7.1.3. Proposed services are discussed in Section 7.2.4.
2-19	The proponent should identify the likely travel routes for bicyclists within the study area. The degree to which these routes can safely support bicycle travel should also be examined.	Likely bicyclist travel routes are discussed in Section 7.2.4 of the Draft EIR.
2-20	Existing or proposed bicycle and pedestrian access routes in the vicinity of the site should be identified. The DEIR should also include discussion of bicycle and/or pedestrian facilities in the vicinity of the project, analyze both existing and future conditions, and identify mitigation, if necessary.	Existing bicycle and pedestrian facilities are discussed in Section 7.1.3. Proposed mitigation, including increased pedestrian and bicycle access, is discussed in Section 7.2.4. Figure 28 illustrates pedestrian connections, internal paths, and bicycle storage locations.

Code	Comment	Response
2-21	The proponent should coordinate with the WRTA on the current operations of Route 15, opportunities for improving service on Route 15 and access to the project site, and potential transit amenities, such as bus pull-outs, bus circulation accommodations, and bus shelters.	Discussions with WRTA and CMRPC regarding opportunities to improve Bus Route 15 service are summarized in Section 7.3. New stop locations at the Project site are proposed/
2-22	The proponent should document these conversations with the WRTA as well as any other transit providers in the area, including but not limited to local transportation providers, private shuttle services, and any employer that could work with the project proponent to provide shared services.	Discussions with WRTA and CMRPC regarding opportunities to improve Bus Route 15 service are summarized in Section 7.3.
2-23	The proponent should also commit to a transit subsidy program to encourage employees to ride public transit.	The Project Proponent will work with tenants and encourage employers to provide a transit subsidy program, as discussed in Section 7.3 of the Draft EIR.
2-24	The DEIR should update the TDM plan so as to fully explore all feasible measures aimed at reducing site trip generation. It should clearly identify measures and demonstrate their effectiveness in reducing site trip generation. The program should be based on the specific measures that have been successful in reducing trip generation for similar redevelopment projects and further investigate measures that would maximize usage of existing pedestrian, bicycle, and transit facilities, such as subsidizing transit passes, promoting ridesharing and vanpooling, and limiting the available parking supply.	The TDM plan has been updated and is discussed in Section 7.3 of the Draft EIR.
2-25	Some additional TDM measures which should be considered for this project are as follows: • Provision of electric vehicle (EV) charging stations with parking reserved for EVs, and provision of infrastructure that would allow for expansion of EV charging stations as demand grows; • Provision of additional on-site amenities including food service, kitchen facilities, mail drop center, etc. that can reduce the need for employees to make	The TDM plan has been updated and is discussed in Section 7.3 of the Draft EIR. The Proponent now is investigating providing one or more EV charging stations with associated EV parking. However, it is noted that the Project Proponent cannot commit that Transportation Coordinator's job will be a full time position at this time.

Code	Comment	Response
	midday convenience trips by automobile; • Management of work shifts to coordinate with the availability of public transportation; and • A commitment to making the Transportation Coordinator's job a full-time position.	
2-26 and 2A-26	The project proponent will be responsible for providing a transportation monitoring program that should be conducted [in conjunction with construction and occupancy of each remaining phase of the project and] for five years from the occupancy of the project. [This program may include, but not necessarily be limited to: • Simultaneous automatic traffic recorder (ATR) counts at each site driveway for a continuous 24-hour period on a typical weekday and Saturday; • Travel survey of employees and patrons at the site (to be administered by the Transportation Coordinator); and • Weekday AM and PM and Saturday peak hour turning movement counts (TMCs) and operations analysis at "mitigated" intersections, including those involving site driveways. The proponent should consult with MassDOT's PPDU and the District 3 Office in order to define a scope of work for the transportation monitoring program.] The goal of the traffic monitoring program will be to evaluate the assumptions made in the DEIR/FEIR and the adequacy of the transportation mitigation measures, as well as to determine the effectiveness of the transportation demand management program.	Details of the proposed transportation monitoring program are discussed in Section 7.3 of the Draft EIR.
2A-26A	The results of each iteration of the monitoring program should be summarized in a technical memorandum provided to the Town of Shrewsbury, Central Massachusetts Regional Planning Commission	This reporting mechanism has been included in the proposed transportation monitoring program, as discussed in Section 7.3 of the Draft EIR.

Code	Comment	Response
	(CMRPC), and MassDOT.	
2-27 and 2A-27	The DEIR should include a draft Section 61 Finding, and it should be updated to include any changes in the mitigation and/or TDM programs [for the full project, outlining the mitigation measures the proponent has committed to implementing in conjunction with this project. The Draft Section 61 Finding will be the basis for MassDOT to issue a Final Section 61 Finding for the project.]	A draft Section 61 Finding has been provided for the limited Phase I and for the Full Build Project in Appendix E – Draft MassDOT Section 61 Findings
2-28	The DEIR should provide an update of the local permitting processes for the proposed project, particularly with respect to any state highway issues being discussed. We strongly encourage the proponent to consult with MassDOT before any transportation issues are discussed in local meetings or hearings.	The Proponent has met several times with MassDOT District 3 to discuss access locations as well as Indirect and Direct Highway Access permits for the Project. Permits applications for the limited Phase I components of the Project have been submitted.
2-29	We encourage the proponent to continue consultation with appropriate MassDOT units, including the Public/Private Development Unit, the District 3 Office, Highway Design, and Traffic Operations to discuss the preparation of the DEIR for the full project.	We met with MassDOT staff to review changes to the Project prior to the Draft EIR submission. Preliminary feedback from MassDOT has been incorporated into the Draft EIR. The Proponent will continue to work with MassDOT throughout the process.
MASSDEP/CERO – FEBRUARY 7, 2014 (COMMENT 3) **MASSDEP/CERO – JULY 29, 2014 (COMMENT 3A)**		
3A-1A	MassDEP reaffirms this [mesoscale analysis] requirement for the project as it is currently proposed in the NPC and requests that the proponent incorporate the increase in the number of average daily trips in its analysis and emissions estimates for volatile organic compounds (VOCs) and oxides of nitrogen (NOx) for the No-Build, Build, and Build with Mitigation Conditions. The DEIR should show and discuss the results of the analysis and emissions estimate.	The mesoscale analysis is included in the Draft EIR GHG report.
3A-1B	MassDEP requests that the Secretary's statements in the Expanded ENF Certificate regarding the implementation of transportation demand management (TDM) measures	The TDM plan has been updated, and is discussed in Section 7.3 of the Draft EIR. However, it is noted that the project Proponent cannot commit that Transportation

Code	Comment	Response
	to reduce trips generated by the original project now be applied to the project as it is currently defined in the NPC. In particular, MassDEP recommends that the proponent: • Hire or designate an on-site transportation demand management (TDM) coordinator to be in place in all phases of the project; • Provide electric vehicle charging stations for employee vehicles; • Designate special parking spaces as preferential parking spaces for carpoolers and vanpoolers; • Provide bicycle racks for patrons of the project's commercial components and long-term bicycle storage, showers, clothing lockers, and other elements for tenant employees to increase the bicycle mode share to the site. Bicycle parking should be secure, convenient, weather protected, and sufficient to meet demand. • Design and construct separate bicycle paths, widened roadway surfaces designated for bicycle use, traffic control devices, and other elements to increase bicycling to the site; • Design and construct pedestrian improvements to the project, including sidewalks, traffic control devices, curb cut ramps, crosswalk signalization, benches, lighting, and other elements to increase walking to the site; • Charge market price for parking spaces used by single occupant vehicle (SOV) drivers to encourage drivers to take other modes of transportation to the site; • Install no-idling signs at truck loading, off-loading, and queuing areas; • Promote public transit by posting schedule information in a public place; • Ensure that the construction equipment to be used on the project site will be either: 1) manufactured to Tier 3 or Tier 4 federal emission standards for off-	Coordinator's job will be a full time position at this time. Similarly, charging market prices for on-site parking is not feasible.

Code	Comment	Response
	road engines; and/or 2) be retrofitted with after-treatment technologies to reduce exhaust emissions. The proponent should provide a list of the equipment, its emission tiers, and, if applicable, the proponent's plans to retrofit each piece in the DEIR.	
3A-1C	In addition, MassDEP recommends that the proponent, as a condition of a tenant's lease, require tenants to: 1) provide employee subsidies for transit passes; 2) establish a rideshare-matching program or enlist the services of a third-party provider such as MassRIDES to match employees in carpools and/or vanpools on at least a quarterly basis; 3) institute a guaranteed ride home program for employees who regularly commute by transit, bicycle or vanpool to the site and who have to leave work in the event of an emergency; and, 4) participate in the EPA SmartWay Transport Program, a voluntary public/private collaboration between the U.S. Environmental Protection Agency (EPA) and the freight industry that is designed to increase energy efficiency and reduce greenhouse gas emissions.	As discussed in Section 7.3, the Project Proponent will work with tenants to provide these TDM measures. However, it is not feasible to include TDM requirements in lease agreements.
3-1	The proponent needs to determine the applicability of the proposed [heating and hot water] system(s) as it may relate to preconstruction regulatory permitting requirements at 310 CMR 7.02 or installation pursuant to the Environmental Results Program requirements at 310 CMR 7.26(30) under the MassDEP Air Pollution Control Regulations. To determine applicability, the fuel type and heat rate input of each fuel burning unit must be known.	At present, distributed gas-fired heating and hot water systems are proposed. While these units have not yet been designed, most fall well below the level of heat input requiring permitting under 310 CMR 7.02. Some may reach the level required for reporting and certification under the Environmental Results Program (ERP). If so, the requirements of the ERP at 310 CMR 7.26 will be followed.
3-2	If an emergency generator is installed, the proponent needs to determine the applicability of the generator as it may relate to preconstruction regulatory permitting requirements at 310 CMR 7.02 or installation under	At present, emergency generation is not planned.

Code	Comment	Response
	the Environmental Results Program requirements at 310 CMR 7.26(40) under the MassDEP Air Pollution Control Regulations. To determine applicability, the fuel type and heat rate input of each unit must be known.	
3-3	If the facility installs any fossil fuel fired equipment with an input rating of 3.00 million BTU/hr or greater, it will be subject to the annual inspection and testing requirements identified in 310 CMR 7.04(4).	None known. All heating and hot water units are expected to be well under 3 MMBTU/hr.
3-4	The proponent should be aware of and review the Department's Noise Policy, Policy 90-001, dated January 16, 1990.	The Proponent is aware of the Department's Noise Policy and is incorporating measures during and following construction to ensure compliance.
3-5	Proper and considered placement of HVAC equipment and emergency generator(s), with the potential addition of noise abatement enclosure for HVAC roof top units or a noise abatement enclosure for generators, could prevent future noise complaints from abutters.	The Proponent will work closely with the Project architect and MEP engineers to place mechanical equipment in most appropriate locations and enclosures where feasible.
3-6	Potential dust, odor, and/or noise generation involved during the clearing/grading operations, demolition, and construction of buildings, parking areas and roadways/access ways. The proponent should be aware of and review the generally applicable requirements at 310 CMR 7.09 and 310 CMR 7.10 under the MassDEP Air Pollution Control Regulations.	The Draft Construction Management Plan (CMP) in Appendix G has been developed to comply with the applicable sections of the Air Pollution Control Regulations. The CMP includes measures to control dust, odor, and noise generated during construction. Please refer to Appendix G for additional details.
3-7	Buildings and/or portions thereof to be demolished/renovated must, in accordance with 40 CFR Part 61 Subpart M (NESHAPS), be thoroughly surveyed for the presence of asbestos containing materials.	Building demolition will be conducted in accordance with 40 CFR Part 61 Subpart M. Prior to the start of any construction related activities, the site will be inspected by a Licensed Site Professional (LSP) for evidence of asbestos containing materials and/or other types of hazardous building materials including but not limited to fuels, solvents, storage tanks, florescent light bulbs, etc. If hazardous materials are encountered on-site, said materials will be removed and disposed of by a licensed contractor under the direction of an LSP. Please refer to the Draft Construction Management Plan in Appendix G for additional
3-8	Asbestos containing materials must be removed by a Massachusetts DLS licensed asbestos contractor, in accordance with 310 CMR 7.15 and all other applicable state and federal regulations, prior to commencing demolition/renovation.	

Code	Comment	Response
		details.
3-9	Additionally, in accordance with 310 CMR 7.09, any construction or demolition of an industrial, commercial, or institutional building or residential building with twenty or more dwelling units requires notification on form BWP-AQ-06 be made to the Department at least ten (10) working days prior to commencement of construction or demolition.	The Project will comply with all applicable Federal, State, and local requirements regarding the handling, recycling, and disposal of solid waste generated by the Project. MassDEP requires notification 10 working days before construction or demolition of a building (BWP-AQ-06).
3-10	Dust control measures shall be utilized during demolition and construction.	Dust mitigation measures to be implemented for this Project include, but are not limited to, the following: • Provide wet suppression to minimize the generation of dust from demolition activities, excavation operations, and on-site vehicle traffic. Use of calcium chloride will also be permitted on-site to control dust. • Cover loads on construction vehicles hauling materials to and from the site. • Cover tops of stockpiles and/or seed with an erosion control mix.
3-11	Demolition activities may result in asphalt, brick, and concrete (ABC) debris. If ABC debris will be crushed at the site of generation and used for fill in accordance with 310 CMR 16.03(2)(b)5, then MassDEP and the Board of Health must be notified at least 30-days prior to commencement of the crushing operation. If the debris is not crushed on-site and used for fill, then other requirements apply.	Asphalt, brick, and concrete (ABC) must also be handled in accordance with the Massachusetts solid waste regulations. In accordance with the regulations, ABC can be taken directly to a recycling operation with no permit or notification to MassDEP. ABC can also be crushed at the site in accordance with the conditions in 310 CMR 16.05(3). The contractor must notify MassDEP and the Shrewsbury Board of Health at least 30 days prior to starting the crushing operation in accordance with 310 CMR 16.03(2)(b)5.
3-12	The project will disturb one or more acres of land and therefore may require a NPDES Stormwater Permit for Construction Activities. The proponent can access information regarding the NPDES Stormwater Requirements and an application for the Construction General Permit at the EPA Website: http://cf-pub.ena.aov/nndes/storrnwater/cap.cfm.	As the total Project area is over one acre, a Notice of Intent (NOI) must be filed with the US EPA and a Stormwater Pollution Prevention Plan (SWPPP) shall be retained on-site during construction. A Draft SWPPP is included within the Stormwater Management Report in Appendix C to demonstrate compliance with the MassDEP Stormwater Management Standards and was developed in accordance with the 2012 NPDES Mas-

Code	Comment	Response
		sachusetts Construction General Permit (CGP).
3-13 and 3A-13	The design of the infiltration BMPs should include a flow bypass structure upgradient to convey high flows during large storms, as well as observation wells to monitor the water surface elevation within the well and to double as a sampling port. [In addition, the proponent should be reminded that the closed subsurface infiltration system proposed for stormwater management will be subject to design standards found under 310 CMR 10.05(6)(k).]	The subsurface systems are designed to detain stormwater runoff from the 2, 10, 25, and 100-year design storms so that a large flow bypass will not be required. Inspection ports will be provided such that conditions can be observed and monitored as required in the Operation and Maintenance Plan. Pretreatment structures (catch basins and stormwater treatment units) will include a bypass to properly pretreat first flush runoff prior to conveyance to the subsurface system; storm flows following the first flush will bypass the stormwater treatment unit and be conveyed directly to the subsurface systems. The subsurface infiltration systems have been designed in accordance with the Stormwater Management Guidelines and Handbook. As the development of each building area progresses, designs for each infiltration or detention area will be detailed.
3-14 and 3A-14	The Operation and Maintenance Plan for the stormwater system, particularly the infiltration BMPs, must remain clearly defined throughout the permitting process in accordance with the Stormwater Standards and the manufacturer's recommended maintenance schedule. [These standards will likely require the owner(s) to perform on-going monitoring and maintenance beyond project completion to ensure the system continues to function as designed in the future.]	The Operation and Maintenance Plan included in the Stormwater Management Report describes the requisite long-term operation and maintenance of all on-site stormwater Best Management Practices (BMPs) and hydraulic drainage system as well as source control for the prevention of pollution. The proposed pre-treatment and treatment structures will require on-going inspections and regular maintenance.
3-15 and 3A-15	[T]he Notice of Intent to be filed for this project should contain sufficient documentation to demonstrate that groundwater conditions will be present and adequate enough to sustain a replicated wetland. [However, given the site constraints of existing soils, bedrock and slopes on the site, concern remains whether the proposed wetlands replication area will meet replication standards found under 310 CMR	The (NOI) for work proposed within the bordering vegetated wetland will include MassDEP Delineation Field Data Forms indicating soil information from test augers, hydrology, and vegetation. Design information will include construction details including grading, planting, construction sequencing, and subsequent monitoring program. Please refer to Chapter 4.0 for additional details.

Code	Comment	Response
	10.55(4).]	
3-16	Since proposed alterations to this wetland area are relatively small, alternative project configurations to filling these wetlands should be explored.	The Proponent explored several different site plan configurations in an effort to avoid or minimize wetland impacts. However, the wetland area is located in the center of the site where complete avoidance is not feasible. The core area of the wetland will be preserved and a replication area is proposed to mitigate approximately 2,200 square feet of fill. Refer to Chapter 4 for details.
3-17	In accordance with 314 CMR 7.00, a sewer extension permit issued by the Department is required for sewer extensions greater than 1,000 feet prior to installation of the sewer, and certification filing(s) to the Department within 60 days after commencement of use is required for sewer extensions less than 1000 feet and connections with discharge greater than 15,000 gpd.	Following the issuance of a MEPA Certificate on the Final EIR, the Proponent will submit application to the Town of Shrewsbury for their approval of the Major Sewer Connection Permit (BRP WP 17) and will follow with submission to MassDEP. No sewer extension is proposed as a municipal sewer exists within Maple Ave.
3-18	The EENF does not include details of the proposed sewers, phased installation, copy of the sewer moratorium, and soil percolation information. The proponent should discuss its wastewater disposal plans and regulatory submittals in more detail in an EIR.	The Draft EIR includes information pertaining to the proposed sewer connections, estimated wastewater generation, inflow and infiltration, connection fees, and required permits. The Town's moratorium applies only to new residential sewer extensions and therefore does not apply to the Project as no sewer extensions are required. Soil percolation information is not relevant since no on-site sewage disposal is proposed. All sewers will connect to the municipal system. Refer to Section 1.4 and Chapter 6 for additional details.
3-19	MassDEP recommends that the proponent consider reducing the number of parking spaces planned to decrease the amount of impervious area.	The Proponent will work closely with Shrewsbury Town Officials during the local approval process to reduce impervious coverage including the following measures: • Provide multi-level structured parking. • Provide shared parking facilities resulting in a 23% reduction in the overall parking provided, as compared to that required under zoning. • Reduced parking stall dimensions • Incorporate 25% compact spaces • Incorporate permeable paving materials

Code	Comment	Response
		where feasible.
3-20	The proponent should consider smart growth and green infrastructure approaches while redeveloping the site.	The Proponent will explore smart growth opportunities wherever practicable and feasible during final site design, engineering, and local permitting.
3-21	The proponent should also consult with the Town of Shrewsbury during the construction phase to confirm that all zoning bylaws are being met.	The Proponent will maintain an ongoing dialogue with Shrewsbury Town Officials throughout construction to ensure compliance with all applicable construction related regulations and any permit conditions that are imposed during the permitting process.
3-22	MassDEP also encourages the proponent to consider Green roofs during the development of this project.	The Proponent will consider incorporating green roof systems for portions of the Project where possible and economically feasible.
MASSACHUSETTS HISTORICAL COMMISSION – JANUARY 15, 2014 (COMMENT 4) **MASSACHUSETTS HISTORICAL COMMISSION – JULY 25, 2014 (COMMENT 4A)**		
4-1 and 4A-1	The MHC looks forward to reviewing the elevation drawings of the proposed rehabilitation of the Chelmsford Ginger Ale Company building….	The requested elevation drawing is provided as Figure 9. Additional details of the proposed rehabilitation will be shared with the MHC during ongoing consultation.
CMRPC – FEBRUARY 7, 2014 (COMMENT 5)		
5-1	[T]he improvement shown appears to reflect the effects [on Transportation GHG] of local mitigation only, and not the negative effects of drawing more (or new) traffic to the area in the first place.	The transportation GHG emissions analysis was done in conformance with the MEPA GHG Policy and Protocol (revised May 5, 2010).
5-2	It is unclear how Vehicle Miles Travelled (VMTs) were calculated as intersection flows do not simply translate into segment flows. Also, as roadway segments are used, the exact definition of the project area becomes an important input.	The Project area and derivation of VMT values are described in Appendix B of the GHG report.
5-3	[S]hould demand to provide bus service to the project site be needed in the future, we	Discussions with the WRTA and CMRPC are summarized in Section 7.3 of the Draft

Code	Comment	Response
	suggest reaching out to the WRTA to discuss service enhancement. Further, we recommend that the developer work directly with the WRTA Administrator to discuss installation of a bus shelter within or near the project site.	EIR. A bus route currently serves the Project site, and the Project Proponent will provide a bus shelter at a new bus stop location and pedestrian connections to all on-site buildings.
TOWN OF SHREWSBURY – FEBRUARY 6, 2014 (COMMENT 6) **TOWN OF SHREWSBURY – JULY 29, 2014 (COMMENT 6A)**		
6A-1A	The Board acknowledges that a zone change will be required to accommodate the proposed development currently in residentially zoned land.	The Proponent understands that a zone change is required if and when the residential parcels located off Oak are acquired in the future.
6A-1B	The Board acknowledges that the applicant does not control all land shown under the NPC and will have to control those parcels to realize the project as proposed.	The Proponent does not currently control the residential parcels located off Oak Street but intends to acquire these properties, if possible, for inclusion in the Project.
6A-1C	The Board would like the applicant to develop the project under the Lakeway Overlay District zoning provisions to the extent practicable.	The Proponent intends to work closely with Shrewsbury Town Officials during the design development phase to develop portions of the Project under the provisions of the Lakeway Overlay District.
6-1	We would like to know more if it is anticipated vehicles leaving the site would take Route 9 West to Elm Street to Old Mill Road to access Route 290.	This travel route is not anticipated for vehicles leaving the Project site.
6-2	[Demonstrate a]dequate queuing lengths exiting the site.	The anticipated queue lengths exiting the Project site at each driveway are summarized in Table 7, Table 8, and Table 9.
6-3	[Show satisfactory p]edestrian access through the very large parking lot to the retail and office spaces.	Extensive pedestrian accommodations have been incorporated into the plan to provide safe, convenient pedestrian movement throughout the Project site.
6-4	Consider… a bus stop and shelter on or proximate to the project site for the Route 15, WRTA bus.	The Project Proponent is coordinating with WRTA and the CMRPC to enhance service on Bus Route 15. A bus stop shelter is currently proposed on Maple Avenue at the Project site.

Code	Comment	Response
6-5	Consider… bicycle racks for users of the project.	Bicycle racks are proposed throughout the site. Refer to Figure 28.
6-6	[C]onsideration… continuing the Route 9 roadway improvements and aesthetics north and east on Maple Avenue and Route 9 to the edge of the project limits including sidewalks and decorative light poles.	Aesthetic improvements along Maple Avenue are not currently proposed as part of this project. Mid-block crosswalks are proposed to connect with the Project site's internal sidewalks and the existing sidewalk on the northwest side of Maple Avenue.
6-7	[Demonstrate a]dequate locations for refuse disposal and snow storage.	As design development continues, the Proponent will identify the required refuse disposal and snow storage areas and incorporate them into the Site Plan submitted to the Town.
6-8	The applicant shall consult with the Engineering Department about the existing water and sewer mains in Maple Avenue and Route 9.	The applicant has met with Town officials several times to discuss water and sewer services and will continue to work with the Town during the local approval process.
6-9	Upgrades of the current water main will be required from a 6 inch main to a 12 inch main along Maple Avenue to Beach Road. Additionally, the applicant shall work with the Town to loop the water through the project site out to Oak Street with an 8 inch main.	The applicant acknowledges that water system upgrades are required in Maple Avenue and will continue to coordinate the upgrades with the Town. A loop connection will also be provided through the site to connect the Maple Avenue and Oak Street water systems.
6-10	There are existing drainage and flooding issues on Maple Avenue on the southern portion of the property site. The applicant shall work with the Town and MassDOT to alleviate these issues.	A portion of the existing Project site contributes runoff directly to Maple Avenue along with an additional 4.5 acres of off-site land northeast of the Project site. The Project is proposing to redirect these flows that are likely contributing to the flooding problems within Maple Avenue. A drainage trunk line is proposed to be constructed on the subject property from the northwest corner of the Project site to the southwest corner of the site. This proposed mitigation will remove about 7.4 cfs of contributing flow from the Maple Avenue drainage system during a 25-year design storm.
6-11 and 6A-11	The applicant and MassDOT should consider an access out of the site via Maple Avenue for Phase I. [The Engineering Department acknowledges that there are two accesses onto Maple	Phase I currently includes access via Maple Avenue via two driveways—one driveway to access the relocated Mason's Lodge and an existing driveway to serve two single family homes.

Code	Comment	Response
	Avenue for Phase I. These access points shall be discussed with the Town and MassDOT.]	
RONALD TARALLO – FEBRUARY 4, 2014 (COMMENT 7) **RONALD TARALLO – JULY 22, 2014 (COMMENT 7A)**		
7A-1A	The Project Change addresses the added parking spaces (195) for Phase 1 but not for the remainder of the project (cinema, 143 dwelling unit, etc.) How much more impervious area will be added to the project?	Although the current master plan represents a substantial increase in density, it will result in a slight decrease of impervious surface as compared to the previously reviewed plans. This was achieved by increasing building heights, integrating levels of structured parking into two of the larger buildings, and introducing a large open air court yard in the center of the site.
7A-1B	If this Project Change is approved, the access to Oak Street should be provided in Phase 1.	The proposed site layout has changed since the NPC. Access to Oak Street is not currently proposed during Phase 1.
7-1	The traffic study did not include the intersection of Maple Ave., Main St., and Rt. 140 at the center of town. What effect will this project combined with the Fairlawn Plaza Redevelopment Project (same owner) have on this already congested area?	The Maple Ave / Main Street and the Main Street / Route 140 intersections have been added as part of the expanded study area included in the Draft EIR. Traffic from the Fairlawn Plaza Redevelopment Project (and several other specific development projects) is included in the Future No-Build projections. The Future Build analysis adds The Grove Project traffic to the Future No-Build traffic volume projections.
7-2	Would commercial vehicles use Beach Road, Old Mill Road, Gale Ave and Oak St.?	Project-related traffic is not anticipated to use Beach Road. Project-related traffic is expected to use Old Mill Road, Gale Avenue, and Oak Street to varying degrees. The Project-related traffic volumes are discussed in Section 7.2.1 of the Draft EIR.
7-3	[Phase I parking] total will be significantly reduced once the following are incorporated into the site drawing per Shrewsbury Bylaws. a. Dumpster and loading dock locations are detailed including fencing and	Phase I has been significantly reduced and now includes only the Masonic Lodge and two single family dwellings off Maple Avenue. In general, the full-build conceptual master full is designed to accommodate delivery trucks and life safety vehicle maneuvering. In most cases, loading and ser-

Code	Comment	Response
	screening. b. Access and egress for fire equipment to the front and rear of the building. c. Access for commercial vehicles to truck dock and dumpsters at the rear of the building and an area for the trucks and fire equipment to turn in order to exit the site. d. Sidewalks and interior landscaping. e. Parking lot screening to protect adjacent property. f. On site drop-off/pick-up area with shelter. After these items are incorporated into the site drawing, would the number of parking spaces be enough to support Phase I?	vice areas will be integrated into the buildings in a manner that they do not require significant paved surface for maneuvering and staging. The plan as designed also includes extensive sidewalks and pedestrian plazas as well as interior parking lot landscaping.
7-4	There isn't any sidewalk in front of the car wash entrance from the bus stop to the intersection of Maple Ave. and Rt. 9. To get from the bus stop to the sidewalk on Rt. 9, bus patrons will walk through the car wash property. How will pedestrians get to the bus stop heading to Worcester?	The location of the proposed WRTA stop 15 and associated pedestrian ways are shown on Figure 28.
7-5	[T]he owner should consult with the WRTA to locate at the site a bus stop for Phase I. This could be an area parallel to Maple Ave. with pick-up/drop-off lanes and shelters which could be used for all phases of the project. A walkway and bicycle path connecting the bus stop and Phase I should be provided and maintained.	The Project Proponent is coordinating with WRTA and the CMRPC to enhance service on Bus Route 15. A bus stop shelter is currently proposed on Maple Avenue at the Project site.
7-6	"The Proponent will work closely with Mass DOT and WRTA to enhance visibility and access to the existing Route #15 stop in Phase I and potentially will provide a pull-off and/or bus shelter at full-build." If this pull-off is not provided, what would be the purpose of the shelter shown on Attachment 5 because this is almost the end of the bus route?	A bus stop could be located near the Project Site, even without a pull-off area. The purpose of a shelter at a bus stop is provide some protection from the elements (rain, snow) while people are waiting for the bus to arrive.
7-7	How many acres of tree removal and stripping of loam will be affected?	Approximately 18.5 acres of the site will be cleared and grubbed to accommodate the Project. Refer to Chapter 3, Land Alteration

Code	Comment	Response
		for additional details.
7-8	If the proposed buildings in Phase II and residential houses in Phase III are never built, …we would be left with barren land subject to erosion, dust, etc.	Based on the highly desirable location of the site, the Proponent anticipates building out the entire Project with no long term delays in construction. Any areas of the site that are exposed and will not be built upon for a period of several months will be temporality stabilized.
MARTHA J. GRANT – JULY 25, 2014 (COMMENT 8)		
8-1	[T]he original traffic study submitted to Mass. DOT is severely flawed. The study did not take the following streets into account: Maple Ave at Beach St. to Egdemont Ave., Rte 9 at Bailey Rd., Rte 9 at Elm St. and also the fact that Old Mill Rd., Harrington Ave., Edgemont Ave., Bailey Rd., Elm St., all intersect with West Main St. at the end of Old Mill Rd. which has a traffic light and is only 1 lane in each direction.	No Project-related traffic is expected to use Beach St, Bailey Rd, or Elm St. The three unsignalized intersections of Maple Ave / Beach St, Route 9 / Bailey Rd, and Route 9 / Elm St are not expected to be significantly impacted. The intersections of Old Mill Rd / Harrington Ave and Old Mill Rd / Main St have been added as part of the expanded study area included in the Draft EIR.
8-2	We are not sure what steps we need to take to monitor the situation. Please keep in mind that we are not against this project. We would just like to keep the impact on our quality of life to a minimum.	Transportation mitigation to set off the negative effects of Project traffic is proposed in Section 7.3. Periodic traffic monitoring will be undertaken to assure that these measures work effectively.
MASSDOER – AUGUST 3, 2014 (COMMENT 9)		
9-1	<u>Building A:</u> The DOER strongly recommends that the proponent consider measures that will further reduce the consumption of grid supplied electricity: Some measures for further consideration: *Reduce the LPD* of the office space by at least 15% below the code maximum. *Reduce Plug loads:* Add mandatory use of energy star rated office machines and appliances in the terms of either the purchase or lease agreement.	The light power density for Office use has been reduced from 1.0 W/sf in the original design to 0.9 W/sf, which equals the requirement of the Stretch Code, even though Shrewsbury is not a Stretch Code community. The possibility of reducing LPD further was considered by the Proponent; he claims a further reduction of 15% to 0.76 W/sf is not financially feasible. The Proponent will encourage tenants to use Energy STAR office machines and appliances. The possibility of increasing

Code	Comment	Response
	Increase the EER of all AC units to at least 15% above the code required minimum. Check with the Town MLP if there any incentives available to assist with the added capital cost. *Incorporate Renewable PV Solar to the maximum possible extent.*	HVAC EER values above those mandated by the IECC 2012 Code was considered by the Proponent. He claims that even a 5% increase in EER above the 2012 Code would add $400,000 to capital costs; a 15% increase in EER would be even more costly, and both are financially infeasible. The local electric utility does not pay financial subsidies to commercial property owners to assist with the capital cost. The Proponent affirms his commitment to set aside "solar-ready" space on commercial building roofs.
9-2	1-Family House: The mitigated as proposed house is projected to use more gas than the baseline case. This is an indication that the performance of critical elements of the house envelope such as roof insulation and window U-Values need further improvement.	The use of 2% more natural gas for heating in the Mitigation Case vs. the Base Case for the single family home is correct and actually reveals the building envelope has a very high level of insulation. Home construction is so airtight and the building enclosure so well insulated in the Base Case, by Code, that a significant amount of space heat is provided in the colder months by waste heats from indoor appliances and lighting. The Mitigation Case reduces electricity used by both indoor appliances and lighting and thus waste heat from those sources. As a consequence, slightly more natural gas is required to meet heating demand.

APPENDICES

APPENDIX A – LARGE SCALE PLANS

APPENDIX B – HISTORIC RESOURCES

APPENDIX C – STORMWATER MANAGEMENT REPORT

APPENDIX D – TRAFFIC IMPACT AND ACCESS STUDY

APPENDIX E – DRAFT MASSDOT SECTION 61 FINDINGS

APPENDIX F – GREENHOUSE GAS REPORT

APPENDIX G – DRAFT CONSTRUCTION MANAGEMENT PLAN

APPENDIX H – CERTIFICATES AND COMMENTS